

**Fish Releases in 1982 from British Columbia
Salmonid Enhancement Operations
Facilities**

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ENHANCEMENT OPERATIONS FACILITIES

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CONTENTS

List of Tables	iv
Abstract	v
I Introduction	1
II Data Collection and Storage	9
III Design of Mark Release/Recovery Studies	13
IV Facility Operations 1982 Releases, Assessment Plans and Production Strategies	15
Appendix 1 Addresses and telephone numbers of SEP facilities	86

LIST OF TABLES

Table

1.	Summary of incubation and rearing technologies for fish released in 1982	3
2a.	Coded-wire tag release report	10
2b.	Finclip release report	11
2c.	Unmarked fish release report	12
3.	Rearing/release studies for fish released in 1982 from Enhancement Operations facilities	14
4.	1982 releases, assessment plans and production strategies by facility in alphabetical order	48
5.	1982 chinook releases by production area, stock and stage at release	61
6.	1982 coho releases by production area, stock and stage at release	64
7.	1982 chum releases by production area, stock and stage at release	67
8.	1982 pink releases by production area, stock and stage at release	70
9.	1982 sockeye releases by production area, stock and stage at release	73
10.	1982 steelhead and cutthroat releases by production area, stock and stage at release	76
11.	SEP biostandards for post-release survival of enhanced juvenile salmonids to catch and escapement	79
12.	Projected catch plus escapement and mark rate for all species released in 1982	80
13a.	Anticipated returns to selected fisheries and mark rates for chum salmon released in 1982	83
13b.	Anticipated returns to selected fisheries and mark rates for pink salmon released in 1982	85

ABSTRACT

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The number of salmonids released in 1982 from each Salmonid Enhancement Program (SEP) Enhancement Operations facility is presented in this report, together with the marking information and plans and rationale for assessment studies directed at chinook, coho, chum and pink salmon. Data are summarized by stage at release and production area. Projected returns using release data and SEP biostandards are calculated and data handling methods described. Production targets for contributing brood years are also included.

Key Words: SEP, juvenile release, hatchery, salmonid, spawning channel

RÉSUMÉ

Cross, C.L. and E.A. Perry. 1985. Fish releases in 1982 from British Columbia Salmonid Enhancement Operations Facilities. Can. Data Rep. Fish. Aquat. Sci. 528:86 p.

Le présent rapport porte sur le nombre de salmonidés mis en liberté en 1982 à chaque installation où sont menées des activités de repeuplement dans le cadre du Programme de mise en valeur des salmonidés (PMVS), ainsi que sur des données de marquage, les plans et l'objet des évaluations visant les saumons quinnat, coho, keta et rose. Les données sont résumées selon le stade au lâcher et la zone de production. Les retours prévus sont calculés à l'aide des données sur les lâchers et les normes biologiques du PMVS; de plus, les méthodes de traitement des données sont décrites. Les objectifs de production pour les années de génération sont aussi inclus.

Mots-clés: lâcher de juvéniles, écloserie, salmonidé, frayère artificielle

I. INTRODUCTION

In 1982 the Facility Operations group operated 17 hatcheries, six spawning channels (two of which were at Fulton River) and three pilot projects as part of the Salmonid Enhancement Program. These facilities are located throughout B.C. (Figure 1) and utilize a variety of enhancement techniques and rearing strategies (Table 1). Various combinations of the five species of Pacific salmon (Oncorhynchus spp.) are cultured, as well as steelhead (Salmo gairdneri) and cutthroat (Salmo clarki) trout.

The majority of the facilities are Federal government owned and operated. Loon Creek Hatchery is an exception as it is a B.C. Fish and Wildlife facility and produces chinook salmon in cooperation with SEP. This arrangement is similar to one whereby steelhead and cutthroat trout are produced in federal hatcheries. Other exceptions include Little Qualicum, a SEP facility operated by Underwood McLellan Ltd. under contract, and Chemainus, a private hatchery which also operates under contract to the Federal government.

This report summarizes the 1982 releases of juvenile salmonids from SEP Facility Operations projects by facility (Table 4), geographical area of release (Tables 5-10), and stage at release. Table 4 also includes production strategies and descriptions of studies designed for assessment of chinook, coho, chum and pink production. Assessment studies and production strategies for steelhead and cutthroat production are the responsibility of B.C. Fish and Wildlife Branch, and are not described in this report. Projected returns by species and catch areas are tabulated in Tables 12 and 13.

Releases by other B.C. agencies (Int. Pac. Sal. Fish. Comm., B.C. Fish and Wildlife) and the Special Projects Unit of SEP are not included in this report. These agencies should be contacted directly for information on their 1982 releases.

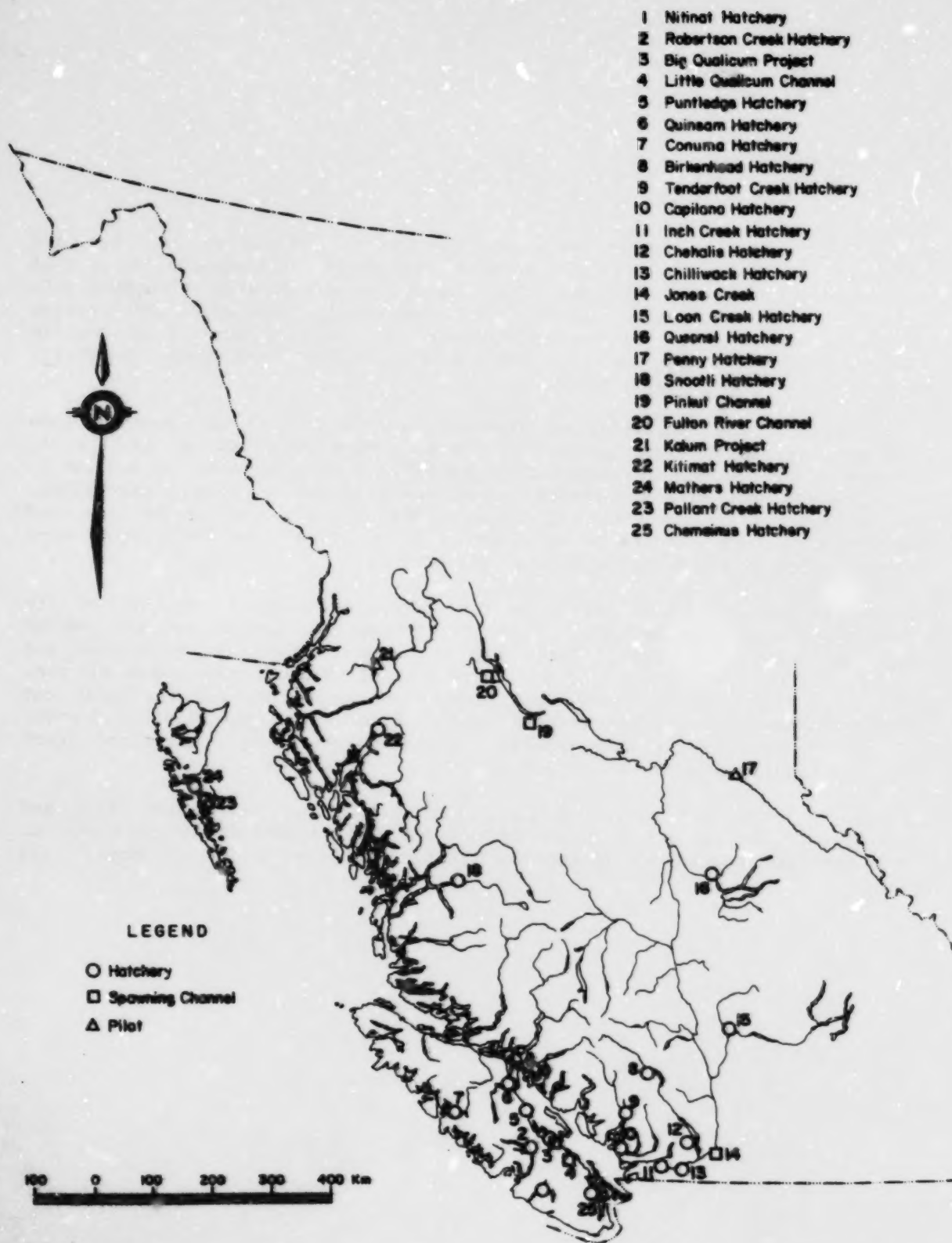


Figure 1. Location of SEP Enhancement Operations Facilities

Table 1. Summary of incubation and rearing technologies for fish released in 1982.

<u>Facility</u>	<u>Species</u>	<u>Incubation Technology</u>	<u>Rearing Technology</u>	<u>Release Stage</u>			
				<u>Fry</u>	<u>Fed Fry</u>	<u>Smolt</u>	<u>*Yearling Smolt</u>
Big Qualicum	chinook	vertical-stacked	earth channels			+	
			concrete raceways			+	
	coho	vertical-stacked	earth raceways		+		
	chum	spawning channel	----	+			
		river flow control	----	+			
		freestyle & deep gravel matrix boxes, vertical-stacked	floating raceways		+		
Birkenhead		vertical-stacked	earth channels		+		
	steelhead	vertical-stacked	circular tubs		+		
			Burrows ponds			+	
	chinook	vertical-stacked	Capilano troughs			+	
Capilano			circular tubs			+	
	chinook	vertical-stacked	Capilano troughs/Burrows ponds				+
	coho	vertical-stacked	Capilano troughs/Burrows ponds		+		
			----	+	+		
	steelhead	vertical-stacked	Capilano troughs/concrete raceways		+		
Chenainus	chinook	vertical-stacked	Capilano troughs				+
	coho	vertical-stacked	Capilano troughs		+		

* refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage			
				Fry	Fed Fry	Smolt	Yearling Smolt
Chilliwack	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
	coho	vertical-stacked	Capilano troughs/ earth channels			+	
	chum	mod. Atkins boxes/ keeper channels	concrete raceways		+		
	steelhead	vertical-stacked	Capilano troughs/ earth channels			+	
Conuma	chinook	vertical-stacked, mod. Atkins boxes/ keeper channels	earth raceways			+	
	coho	vertical-stacked	Capilano troughs/ earth/concrete raceways		+		
	chum	mod. Atkins & freestyle boxes/ keeper channels	earth channels		+		
			concrete raceways		+		
Pulton			Capilano troughs		+		
	sockeye	spawning channel controlled river flow	----- -----	+	+		
Inch Cr.	coho	vertical-stacked	Capilano troughs/ concrete raceways			+	
	chum	mod. Atkins boxes/ keeper channels	concrete raceways			+	

* refers to chinook only

Table 1 (cont'd.)

<u>Facility</u>	<u>Species</u>	<u>Incubation Technology</u>	<u>Rearing Technology</u>	<u>Release Stage</u>			
				<u>Fry</u>	<u>Fed Fry</u>	<u>Smolt</u>	<u>*Yearling Smolt</u>
Jones Cr.	pink	spawning channel	----	+			
Kalum	chinook	vertical-stacked	Capilano troughs		+		
Kitimat	chinook	vertical-stacked	Capilano troughs			+	
	coho	vertical-stacked	Capilano troughs		+		
	chum	vertical-stacked	Capilano troughs		+		
	steelhead	vertical-stacked	Capilano troughs		+		
Little Qualicum	chinook	supplied as fry	earth ponds			+	
	chum	spawning channel	----- floating raceway	+			
	steelhead	supplied as fingerlings	earth ponds		+		
Loon	chinook	vertical-stacked	Capilano troughs		+		
Mathers	chum	vertical-stacked, deep matrix gravel boxes	modular above-ground raceways		+		
	chinook	vertical-stacked	concrete raceways			+	
Nitinat	chinook	mod. Atkins & freestyle boxes/keeper channels	concrete raceways		+		

*refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage		
				Fry	Fed Fry	*Yearling Smolt
Pallant	coho	vertical-stacked	Capilano troughs/ concrete raceways		+	
	chum	vertical-stacked, deep matrix gravel boxes	concrete raceways/ seapens		+	
	steelhead	vertical-stacked	concrete raceways		+	
	chinook	vertical-stacked	Capilano troughs		+	
Pinkut	sockeye	spawning channel controlled river flow	----- -----	+		
				+		
Puntledge	chinook	vertical-stacked	Capilano troughs/ concrete raceways earth channels			+
	coho	vertical-stacked	Capilano troughs/ earth raceways		+	+
	chum	mod. Atkins boxes/ keeper channels, deep matrix gravel boxes	concrete raceways		+	
	pink	mod. Atkins boxes/ keeper channels, deep matrix gravel incubators	seapens		+	
	steelhead	vertical-stacked	Capilano troughs/ circular tubs/ earth channels	+		
					+	

* refers to chinook only

Table 1 (cont'd.)

<u>Facility</u>	<u>Species</u>	<u>Incubation Technology</u>	<u>Rearing Technology</u>	<u>Release Stage</u>		
				<u>Fry</u>	<u>Fed Fry</u>	<u>*Yearling Smolt</u>
Quesnel	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+
Quinsam	chinook	vertical-stacked	Capilano troughs/ Burrow's ponds			+
	coho	vertical-stacked	Capilano troughs Burrow's ponds	+		+
	chum	deep matrix gravel boxes	Capilano troughs	+		
	pink	deep matrix gravel boxes	----- seapens	+		
	steelhead	vertical-stacked	Capilano troughs/ circular tubs	+		+
Robertson Cr.	chinook	vertical-stacked freestyle boxes/ keeper channels	Capilano troughs/ earth/concrete raceways			+
	coho	vertical-stacked	Capilano troughs/ earth channels			+
	steelhead	vertical-stacked	Capilano troughs/ circular tubs/ earth/concrete raceways	+		

* refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage		
				Fry	Fed Fry	*Yearling Smolt
Snoutli	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+
	coho	vertical-stacked	Capilano troughs/ concrete raceways		+	
	chum	mod. Atkins boxes/ keeper channels	concrete raceways		+	
	steelhead	vertical-stacked	circular tube		+	
Tenderfoot Cr.	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+
Tsolum	pink	false-floored keeper/ keeper channels	Seapens -----	+		

* refers to chinook only

II. DATA COLLECTION AND STORAGE

For assessment purposes, each group of fish released is considered to be one of three types; unmarked (i.e. unrepresented by a mark), represented by a wire tag code, or represented by a fin clip. For each release type, there is a unique release report format which includes information on release site, size, date, and number, as well as tagging data, if applicable (Tables 2a, 2b, and 2c). Upon release of a group of fish, the hatchery staff will fill out the appropriate version of the release report and return it to the assessment section of the Facilities Operations group for data verification and entry into the release data base. Copies of the CWT and finclip forms are then forwarded through the Mark Recovery Group to the Pacific Marine Fisheries Commission for inclusion in the Pacific coast release summary.

Methods for enumerating unmarked and total release numbers for release reports vary from facility to facility. As a general rule, CWT groups are enumerated during the tagging operation using the Quality Control Device count adjusted for double counts and subsequent mortalities. Finclip release groups are enumerated during clipping using tally counters, with totals again adjusted for mortalities. Total releases are usually calculated from a book balance (number of eggs taken minus cumulative incubation and rearing mortality) or estimated by a Petersen mark-recapture. Any questions regarding specific inventory methods or numbers should be referred directly to the pertinent hatchery. Addresses and phone numbers are listed in Appendix 1.

All 1982 release data in this report were stored using the DB Master data management system and an Apple II+ microcomputer. Copies of the data discs and brief documentation on field layouts are available to interested parties upon receipt of two blank 5 1/4" floppy diskettes. You must have a DB Master disk available to access the data.

AGENCY

UNMARKED FISH RELEASE REPORT

BIO PROGRAM COORDINATOR

5th FLOOR

1090 W PENDER STREET

VANCOUVER, B.C. V6B 2P1

For each unmarked release group please
provide the following information and return to:
please double-check all figures ACCURACY IS IMPORTANT

[illegible]

III. DESIGN OF MARK RELEASE/RECOVERY STUDIES

Marking studies are designed to determine survival and contribution of a particular group of fish to the fisheries and escapement or to determine the relative performance of experimental groups of fish (Table 3). A key feature of SEP Operations' marking is that a large scale program is necessary solely for facility assessment. In order to generate maximum benefit from this fundamental, costly requirement, we direct much effort to the design of experimental releases such that they may be rolled up to provide basic assessment data. For example, we may mark 150,000 chinook juveniles with one tag code to evaluate production from a total release of 1,500,000 fish on June 15. On the other hand, we may uniquely mark three groups of 50,000 fish each and release the first group among 500,000 fish on June 1, the second group among 500,000 fish on June 15, and third group among 500,000 fish on June 30. The latter approach provides information on the effect of release date and/or size on subsequent survival so that our future release strategies can be optimized. In addition, by accumulating recovery data for all three release groups we have statistically sound data for determination of catch and escapement from the total release.

Single mark group studies to assess survival and contribution are designed to provide 95 percent confidence with a 10 percent confidence interval in the estimated catch of all (not each) age classes. Multiple mark group studies to assess relative survival of experimental lots are designed to demonstrate 25 percent differences in survival at confidence levels of 95 percent for Type 1 and Type 2 errors and a 10 percent confidence interval. Differences of this magnitude (25 percent) were chosen as a level at which changes from current practise might be pursued. If differences between experimental and control lots were, for example, only 10 percent the benefits of change may not justify the added marking costs to achieve the required level of precision to demonstrate such a small increment.

Equations we use to calculate marking requirements are based on the hypergeometric distribution. Inputs in addition to statistical criteria include anticipated survival rates (Table 11) and sample rates in the fishery or escapement. Programs for this analysis are available on the Apple II+ microcomputer as a component of the Fishculture Information System for Hatcheries package designed by SEP Enhancement Operations.

In reality, it is not always possible to mark ideal numbers of fish due to logistical or cost constraints. In many cases we decide to proceed with reduced marking programs on the grounds that information in which we have 90 percent confidence, or even 80 percent confidence is better than no information.

Table 3. Rearing/release studies for fish released in 1982 from Enhancement Operations facilities.

<u>Study Type</u>	<u>Species</u>	<u>Location</u>
Imprinting at release/homing	chinook coho	Penny, Snootli Chilliwack
Date of release	chinook chum coho pink	Big Qualicum, Capilano, Puntledge Conuma, Nitinat, Pallant, Puntledge Robertson Creek Puntledge, Quinsam
Size at release	chinook chum pink	Capilano Big Qualicum, Little Qualicum, Conuma, Nitinat Puntledge, Quinsam
Time and size at release	chinook coho	Quinsam Capilano
Pre-migrant release	chinook coho	Loon Creek, Penny Capilano, Inch, Pallant, Puntledge, Snootli
Transplant	chinook	Chilliwack
Clipped fin regeneration	chum pink	Chilliwack, Snootli Puntledge, Quinsam
Grading during rearing	coho	Capilano
Impact of cataract on survival	coho	Quinsam
Diet evaluation	chinook	Robertson
Comparison of alternative hatchery water supplies	chinook chum	Kitimat Mathers
Heritability of adult traits	chinook coho	Quesnel Puntledge

IV. FACILITY OPERATIONS 1982 RELEASES, ASSESSMENT PLANS AND PRODUCTION STRATEGIES

Release numbers, dates, fish size and release location for each facility and stock are listed in Table 4. Facilities are arranged alphabetically.

A description of assessment studies for salmon species is included for each hatchery and stock immediately following the tabulated release information. Steelhead and cutthroat assessment studies are not described; information regarding these species may be obtained from the B.C. Fish and Wildlife Branch. Production strategies are also included to provide some insight into the rationale for stock selection, if not obvious, as well as production levels attained versus targetted and techniques, where appropriate.

When using Table 4, the following notes explain codes and abbreviations which are not obvious.

Notes

A. General Notes

1. Release column abbreviations
 - LV Left ventral
 - RV Right ventral
 - AD Adipose
 - LMAX Left maxillary
 - RMAX Right maxillary
 - NONE No finclip applied

Each finclip abbreviation is immediately followed by a letter/number combination. These are used to uniquely identify the finclip release groups for searching and sorting the data base; they have no other significance.

2. Species Abbreviations
 - CHIN chinook
 - SOCK sockeye
 - STHD steelhead
 - SSTH summer steelhead
 - WSTH winter steelhead
 - CUTT cutthroat

3. All CWT groups are designated by AD AGD1D2 where;
 - AD Adipose
 - AG 2 digit agency code
 - D1 2 digit data code
 - D2 2 digit data code

4. Number released

Marked - number of valid adipose clipped wire tagged fish for CWT groups
 - number of fish with valid finclips for finclip groups

Incomplete - number of adipose only fish for CWT groups
 - number of incomplete clips for finclip groups

5. GWG stands for Geographic Working Group. There are three GWG's: North Coast; South Coast; and Fraser River, Northern B.C., Yukon. They consist of representatives from the Department of Fisheries and Oceans and the B.C. Fish and Wildlife Branch who share a wide variety of responsibilities, including the review of SEP production targets.

B. Explanations of specific abbreviations

<u>Page</u>	<u>Abbreviation</u>	<u>Column</u>	<u>Explanation</u>
18 & 38	Bg Qualicum	Stock	Big Qualicum
18	Var. Lakes	Site	Various lakes
18	Mundie's Chn	Site	Mundie's channel
18	Chase/Mill	Site	Chase & Millstream Crks.
21 & 22	Up. Watrshed	Site	Upper watershed
26	Dol. Varden	Site	Dolly Varden
28	Htd Incub Water	Comments	Heated incubation water
30	Fulton Ch.	Site	Fulton channel
32	Upr. Siddle	Site	Upper Siddle Cr.
32	Nicomen Sl.	Site	Nicomen Slough
32	Brun/Marshall	Site	Brunette & Marshall Crks.
35	Ced/Clr	Stock	Cedar & Clear Rivers
36	Kitimat Trib	Site	Kitimat tributaries
38	CWT121708 incld	Comments	Includes two codes; 121707 & 121708
38	Lt Qualicum	Site	Little Qualicum
40	Up. Nicola Rel.	Comments	Upper Nicola release
40	Low. Nicola Rel.	Comments	Lower Nicola release
40	Bonapart	Site	Bonaparte R.
40	Up. Bonap. Rel.	Comments	Upper Bonaparte release
40	Low. Bonap. Rel.	Comments	Lower Bonaparte release
42	Rel. unrep.	Comments	Release unrepresented
44	Mosq. Lk. Rel.	Comments	Mosquito Lake release
44	Mosq. Cr. Rel.	Comments	Mosquito Creek release
44	Up. Pallant Rel.	Comments	Upper Pallant release
47	Pinkut Ch.	Site	Pinkut channel
48	Punt-Fall	Stock	Puntledge fall - run
48	Punt-Summer	Stock	Puntledge summer - run
48	Exp. Substr. Grp	Comments	Experimental substrate group
48	Upr. Punt.	Stock	Upper Puntledge R.
48	Lt. Spwn. Progn	Comments	Late spawners' progeny
48	Mid. Spwn. Progn	Comments	Middle spawners' progeny
48	Ear. Spwn. Progn	Comments	Early spawners' progeny

B. Explanations of specific abbreviations (continued)

<u>Page</u>	<u>Abbreviation</u>	<u>Column</u>	<u>Explanation</u>
53	Upr. Quinsam	Site	Upper Quinsam R.
53	Mid. Quin. Rel.	Comments	Middle Quinsam release
53	Camp. Estury	Comments	Campbell R. estuary reared
56	Rb. Late Htch.	Comments	Robertson late hatchery stock
56	Rb. Early Htch.	Comments	Robertson early hatchery stock
56	Rb. Late Wild	Comments	Robertson late wild stock
56	Robrtsn. Cr.	Site/Stock	Robertson Creek
58	Noos/Sall	Site	Noosgulch & Salloomat
58	Snoot/Nuhlk	Site/Stock	Snootli & Nuhalk
58	Necleet.	Site/Stock	Necleetsconnay
58	L. Bel. Coola	Comments	Lower Bella Coola release
58	Fish/Air	Site/Stock	Fish Cr. & airport side-channel
60	Inc/rrd at Cap.	Comments	Incubated and reared at Capilano hatchery

Table 4. 1982 releases, assessment plans, and production strategies

PAGE 1

BIG QUALICUM

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPLETE	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
										START DD-MM-YY	END DD-MM-YY	
CHIN	BG QUALICUM BG QUALICUM	81	AD	022223	50866	1682	0	52548	9.1	21-06-82	22-06-82	LATE RELEASE
CHIN	BG QUALICUM BG QUALICUM	81	AD	022306	51307	1696	3341277	3394280	6.9	11-06-82	14-06-82	PRODUCTION
CHIN	BG QUALICUM BG QUALICUM	81	HOWES		0	0	19960	19960	5.5	12-06-82	12-06-82	DIET STUDY
TOTALS	FOR CHIN				102173		3376	3361237	3466788			
CHUM	BG QUALICUM BG QUALICUM	81	RV10		84771	7662	2063120	2155553	1.0	06-05-82	13-05-82	FED FRY RELEASE
CHUM	BG QUALICUM BG QUALICUM	81	ADRV11		245977	13855	43028086	43285918	0.3	27-04-82	12-05-82	FRY RELEASE
TOTALS	FOR CHUM				330748	21517	45089206	45441471				
CONO	BG QUALICUM BG QUALICUM	80	AD	022229	51984	1608	1129154	1182746	18.6	19-05-82	31-05-82	
CONO	BG QUALICUM HURTS CR	81	HOWE10		0	0	346950	346950	1.6	24-05-82	08-06-82	
CONO	BG QUALICUM CRAIG CR	81	HOWE11		0	0	10000	10000	9.0	31-12-82	31-12-82	
CONO	BG QUALICUM WILE CR.	81	HOWE9		0	0	150000	150000	1.5	18-05-82	28-07-82	
TOTALS	FOR CONO				51984	1608	1636104	1689696				
STND	ENGLISHMAN	81	AD	121608	8885	468	1714	11067	41.9	20-05-82	20-05-82	
STND	ENGLISHMAN	81	AD	121609	9320	489	1797	11606	41.9	20-05-82	02-06-82	
STND	WILD-BQR	81	AD	121812	24388	1283	0	25671	67.9	17-05-82	17-05-82	
STND	BG QUALICUM MUNDY'S CHN	81	AD	121828	792	408	0	1200	15.0	22-05-82	22-05-82	
STND	BG QUALICUM VAR.LAKES	82	HOWE12		0	0	22684	22684	5.6	17-05-82	17-05-82	COLORIZATION
STND	BG QUALICUM CHASE/MILL	81	HOWE7		0	0	22648	22648	68.9	01-06-82	01-06-82	
TOTALS	FOR STND				42385	2648	48843	94876				
GRAND TOTALS					528290	29151	50135390	50692811				

Table 4 (cont'd.)

BIG QUALICUM**Assessment:**

- chinook - 2 CRT release groups to evaluate effect of release date on survival (fish released late larger than fish released early)
- early June release avoided due to probable predation by birds
- returns from unmarked feed study groups will be estimated from survival data for CRT 02-23-06
- CRT 02-23-06 is most representative of "production"
- chum - unfed fry marked (ADRV) to determine survival of channel and river fry to catch and escapement
- fed fry marked (RV) to evaluate effect of rearing on post-release survival
- coho - single CRT group to determine survival of released smolts
- coho fry outplants not assessed

Production Strategies:

<u>Species</u>	<u>Stock</u>	<u>Brood Year</u>	<u>Stage at Release</u>	<u>No. Juveniles</u>	
				<u>Target</u>	<u>Released</u>
Chinook	Big Qualicum	1981	Smolt	3,000,000	3,466,788
Chum	Big Qualicum	1981	Fry	55,000,000	43,285,918
Chum	Big Qualicum	1981	Fed Fry	1,800,000	2,155,553
Coho	Big Qualicum	1980	Smolt	1,000,000	1,182,746
Coho	Big Qualicum	1981	Fed Fry	500,000	506,950

Chinook: Smolt release as planned. Additional chinook production transferred to Little Qualicum rearing facility as fry.

Chum: Production was as planned but lower than expected fry numbers due to below average survival in the spawning channel.

Coho: Smolt production as planned. Transplant of coho fry to Hunt's, Thames, Nile, Annie, Beach and Craig creeks was approved by Geographic Working Group (GWC). Hatchery staff transplanted to Hunt's, Craig and Nile creeks only; other streams were considered adequately stocked or were enhanced through the Public Involvement Program.

Table 4 (cont'd)

PAGE 1

BIRKENHEAD												
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START DO-WR-YY	END DO-WR-YY	
CHIN	BIRKENHEAD	BIRKENHEAD	80	AD 921915	8291	1463	0	9754	44.7	30-04-82	30-04-82	EXTENDED REARING
CHIN	BIRKENHEAD	BIRKENHEAD	81	AD 022340	35050	909	0	35959	3.5	30-04-82	25-08-82	.....
T O T A L S F O R C H I N												
					43341	2372	0	45713				
G R A N D T O T A L S												
					43341	2372	0	45713				

BIRKENHEAD

Assessment:

- single CWT group to determine survival of yearling 1980 brood smolts for comparison to subyearling release in 1981
- single CWT group to determine survival of subyearling 1981 brood smolts

Production Strategies:

Species	Stock	Brood Year	Stage at Release	
			Target	Released
Chinook	Birkenhead	1980	Yearling smolt	15,000
Chinook	Birkenhead	1981	Subyearling	93,000
				35,959

Chinook: Extended rearing of chinook to yearling stage was continued (initiated with 1979 brood year) in response to concerns that fish released as subyearlings may overwinter in fresh water and have a low rate of survival to catch and escapement. Production was less than target due to low escapement numbers.

Table 4 (cont'd)

CAPILANO													PAGE 1
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	START DD-MM-YY	END DD-MM-YY	COMMENTS	
CHIN	CAPILANO	CAPILANO	80	AD	021809	31575	2177	0	33752	41.3	14-04-82	14-04-82	YEARLING SMOLT
CHIN	CAPILANO	CAPILANO	81	AD	022308	40025	1016	297884	338925	3.8	14-05-82	14-05-82	EARLY RELEASE
CHIN	CAPILANO	CAPILANO	81	AD	022309	42546	601	294072	337219	3.9	28-05-82	28-05-82	MID RELEASE
CHIN	CAPILANO	CAPILANO	81	AD	022310	42626	275	273951	316852	5.3	11-06-82	11-06-82	LATE RELEASE
----- T O P A L S F O R CHIN -----													
					156772	4069	865907	1026748					
CONO	CAPILANO	CAPILANO	80	AD	022112	19632	1224	46097	66953	17.5	02-06-82	02-06-82	NOT GRADED
CONO	CAPILANO	CAPILANO	80	AD	022212	18226	2642	42340	63208	21.6	02-06-82	02-06-82	LARGE/GRADED
CONO	CAPILANO	CAPILANO	80	AD	022213	16228	4620	53936	74784	18.2	02-06-82	02-06-82	MED LUN/ GRADED
CONO	CAPILANO	CAPILANO	80	AD	022214	18245	3193	50739	72177	14.4	02-06-82	02-06-82	SMALL/ GRADED
CONO	CAPILANO	CAPILANO	80	AD	022234	20936	0	15346	36282	18.1	25-05-82	25-05-82	EARLY RELEASE
CONO	CAPILANO	UP WATERSHED	81	AD	022406	50464	2542	213147	266153	3.0	01-09-82	30-09-82	FED FRY RELEASE
CONO	CAPILANO	CAPILANO	81	AD	022407	51380	2352	3105	56837	3.0	07-10-82	08-10-82	FED FRY RELEASE
CONO	CAPILANO	CAPILANO	80	AD	081615	3711	399	0	4110	12.6	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081656	3763	404	0	4167	13.0	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081657	4024	432	0	4456	13.3	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081658	3860	415	0	4275	15.6	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081659	4157	446	0	4603	16.2	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081660	3244	348	0	3592	16.2	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081661	4175	448	0	4623	18.9	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081662	4160	447	0	4607	18.9	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081663	3673	395	0	4068	19.7	07-05-82	07-05-82	TIMSIS 1ST REL
CONO	CAPILANO	CAPILANO	80	AD	081702	4501	41	0	4542	12.6	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081703	3848	35	0	3883	12.3	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081704	4518	41	0	4559	12.6	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081705	4435	40	0	4475	16.8	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081706	4390	40	0	4430	16.8	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081707	4122	37	0	4159	16.2	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081708	4526	41	0	4567	20.6	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081709	4591	42	0	4633	19.7	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081710	4381	40	0	4421	20.6	28-05-82	28-05-82	TIMSIS 2ND REL
CONO	CAPILANO	CAPILANO	80	AD	081711	4473	73	0	4546	14.6	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081712	4462	73	0	4535	14.2	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081713	4272	69	0	4341	13.8	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081714	4460	73	0	4533	18.9	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081715	4462	73	0	4535	19.7	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081814	4028	65	0	4093	18.9	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081815	4243	69	0	4312	21.6	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081831	4245	69	0	4314	21.6	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	081915	4587	75	0	4662	22.7	09-07-82	09-07-82	TIMSIS 4TH REL
CONO	CAPILANO	CAPILANO	80	AD	082037	4524	97	0	4621	13.3	18-06-82	18-06-82	TIMSIS 3RD REL
CONO	CAPILANO	CAPILANO	80	AD	082038	4428	95	0	4523	13.3	18-06-82	18-06-82	TIMSIS 3RD REL
CONO	CAPILANO	CAPILANO	80	AD	082039	4192	90	0	4272	13.8	18-06-82	18-06-82	TIMSIS 3RD REL
CONO	CAPILANO	CAPILANO	80	AD	082040	4514	97	0	4611	18.1	18-06-82	18-06-82	TIMSIS 3RD REL
CONO	CAPILANO	CAPILANO	80	AD	082041	4526	97	0	4623	18.9	18-06-82	18-06-82	TIMSIS 3RD REL
CONO	CAPILANO	CAPILANO	80	AD	082042	4282	92	0	4374	18.9	18-06-82	18-06-82	TIMSIS 3RD REL

Table 4 (cont'd)

CAPILANO

PAGE 2

SPECIES	SEX	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPLETE	UNMARK			START DO-WM-YY	END DO-WM-YY	
CORO	CAPILANO	CAPILANO	80	AD	082043	4599	0	0	4698	18-06-82	18-06-82	TINISIS 3RD REL.
CORO	CAPILANO	CAPILANO	80	AD	082044	4556	0	0	4654	18-06-82	18-06-82	TINISIS 3RD REL.
CORO	CAPILANO	CAPILANO	80	AD	082045	4264	0	0	4355	18-06-82	18-06-82	TINISIS 3RD REL.
CORO	CAPILANO	CAPILANO	80	HOMEBOC	0	0	7362	7362	18.8	07-06-82	07-06-82	.....
CORO	CAPILANO	UP WATSHED	81	HOMEBOC	0	0	216430	216430	3.0	30-06-82	08-07-82	FED FRY RELEASE
CORO	CAPILANO	UP WATSHED	81	HOMEBOC	0	0	90000	90000	0.5	07-05-82	07-05-82	UNFED FRY REL.
CORO	CAPILANO	UP WATSHED	81	HOMEBOC	0	0	263090	263090	0.7	30-04-82	06-05-82	FED FRY RELEASE
TOTALS FOR CORO						348297	22159	1067592	1428048			
CUTT	CAPILANO	UP WATSHED	82	HOMEBOC	0	0	1281	1281	1.5	07-10-82	07-10-82	.....
TOTALS FOR CUTT						0	0	1281	1281			
SUTH	CAPILANO	UP WATSHED	82	HOMEBOC	0	0	13650	13650	3.0	15-11-82	15-11-82	.....
TOTALS FOR SUTH						0	0	13650	13650			
WETH	CAPILANO	UP WATSHED	82	HOMEBOC	0	0	3097	3097	2.4	10-11-82	10-11-82	.....
TOTALS FOR WETH						0	0	3097	3097			
GRAND TOTALS						505069	26228	1951527	2482824			

Table 4 (cont'd.)

CAPILANO

Assessment:

- chinook - single CWT group release of yearling 1980 brood (CWT 02-18-09) to evaluate effect of extended rearing, partially under artificial lighting, on survival to catch and escapement
- 3 CWT groups to determine the effect of release date on survival of subyearling smolts.
- CWT groups 02-23-09, 10 are most representative of "production"
- coho - 36 CWT groups to determine the effect of time and size at release on survival, age at maturity, etc., (T. Bilton)
- 4 CWT groups to determine the effect of grading on survival, age at maturity, etc.
- 1 CWT group representing smolts released early (CWT 02-22-34) to reduce hatchery loads
- 2 CWT groups representing fed fry plants (1981 brood) above and below Cleveland dam
- contribution of unmarked 1981 brood fry releases will be calculated based on survival of marked 1981 brood fed fry releases at Capilano and releases of smaller fry at other locations
- CWT 02-21-12 is most representative of "production"

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Release		Target	Released
Chinook	Capilano	1980	Yearling smolt		-	33,752
		1980	Subyearling smolt		1,300,000	992,996
Coho	Capilano	1980	Smolt		500,000	545,538
		1981	Fed Fry		300,000	802,510
		1981	Unfed Fry		-	90,000
Pink	Capilano	1981	Fed Fry		100,000	0
Chum	Capilano	1981	Fed Fry		140,000	0

Chinook: Smolt release lower than planned due to shortfall in available eggs. Fish released in 1982 were all progeny of adults returning to Capilano from previous transplants of Big Qualicum stock. Extended rearing of some 1980 brood chinook was not originally intended but was added on an opportunity basis.

Coho: Smolt production as planned. Fry releases exceeded plan as a result of excessive egg-take (partially in anticipation of aquaculture demand for eggs that did not materialize). Fry plants are intended to ensure adequate adult escapement (approximately 2,000 fish) if total loss of the hatchery population should occur during rearing. Fry release targets are based on producing returns of this or greater magnitude rather than on estimated carrying capacity of the upper watershed.

Chum: Low level enhancement targets were added in response to very poor stock conditions. Adults were to be captured in the lower river and tributaries (primarily Brothers Creek) but none were taken.

Pink: See chum.

Table 4 (cont'd)

PAGE 1

CHEMAMINUS

SPECIES STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPLETE	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
								START	END	
CHIN	CHEMAMINUS	81	MONET19	0	0	13723	5.5	28-05-82	10-06-82	.....
----- TOTALS FOR CHIN -----										
				0	0	13723				-----
Coho	CHEMAMINUS	81	MONET18	0	0	26296	4.6	01-06-82	12-06-82	.....
----- TOTALS FOR COHO -----										
				0	0	26296				-----
----- GRAND TOTALS -----										
				0	0	40019				-----

CHEMAMINUS

Assessment:

- chinook and coho - no marking; numbers of fish insufficient for marking studies
- assessment will be based on returns of unmarked fish

Production Estimates:

Species	Stock	Brood Year	Stage at Release	
			Target	Released
Chinook	Cheamainus	1981	150,000	13,723
Coho	Cheamainus	1981	125,000	26,296

Chinook: Target was 150,000 smolts if all eggs were taken from Cheamainus run. If full Cheamainus target was unavailable, egg-take could be supplemented with transplanted Cowichan chinook eggs (crossed with Cheamainus chinook silt) to a total of 140,000 smolts. Cowichan stock was used to supplement production in the 1979 and 1980 brood years. Escapement to Cheamainus was poor and eggs were not available from Cowichan.

Coho: First year of coho production at Cheamainus. Production was limited by brood stock availability.

Table 4 (cont'd)

CHILLIWACK RIVER

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	RELEASE DATE END DD-MM-YY	COMMENTS
CHIN	CHILLIWACK	CHILLIWACK	81	AD 022128	4638	28	309	4975	3.8	31-05-82	31-05-82	.....
CHIN	PITT	PITT R.	81	AD 022157	48299	1001	0	49300	4.0	08-04-82	08-04-82	.....
CHIN	PITT	CHILLIWACK	81	AD 022159	48188	3156	6500	57844	8.7	10-05-82	19-05-82	.....
CHIN	HARRISON	CHILLIWACK	81	AD 022163	74018	1280	281097	356388	5.3	02-06-82	02-06-82	.....
CHIN	PITT	CHILLIWACK	81	NOHECC9	0	0	2521	2521	2.0	01-05-82	01-05-82	PINHEADS
----- T O T A L S F O R CHIN -----												
					175143	5465	290420	471028				
CHIN	CHILLIWACK	CHILLIWACK	81	LV8	49442	0	870469	919811	1.1	29-04-82	29-04-82	.....
CHIN	CHILLIWACK	CHILLIWACK	81	RV7	107264	0	1997314	2104578	1.1	29-04-82	29-04-82	.....
CHIN	CHILLIWACK	CHILLIWACK	81	ADLV9	48874	0	860469	909343	1.1	29-04-82	29-04-82	.....
----- T O T A L S F O R CHIN -----												
					205580	0	3728252	3933832				
COMO	DOL.	VARDEN DOL.	80	AD 021818	5008	0	0	5008	25.2	12-05-82	14-05-82	HELD 3 DAYS
COMO	DOL.	VARDEN DOL.	80	AD 021902	10096	0	0	10096	25.2	14-05-82	14-05-82	HELD 0 DAYS
COMO	POST CREEK	POST CR	80	AD 021905	14575	420	0	14995	25.2	07-05-82	07-05-82	HELD 0 DAYS
COMO	SALWEIN	SALWEIN CR	80	AD 022114	19821	261	0	20082	25.2	17-05-82	17-05-82	HELD 0 DAYS
COMO	SALWEIN	CHILLIWACK	80	AD 022231	19916	161	2000	22077	25.2	11-05-82	11-05-82	HATCHERY RELEASE
COMO	POST CREEK	CHILLIWACK	80	AD 022232	19884	427	2000	22311	25.2	11-05-82	16-05-82	HATCHERY RELEASE
COMO	DOL.	VARDEN DOL.	80	AD 022233	15069	137	100	15306	25.2	02-05-82	14-05-82	HELD 13 DAYS
COMO	DOL.	VARDEN CHILLIWACK	80	AD 022245	14865	105	0	14970	25.2	11-05-82	16-05-82	HATCHERY RELEASE
COMO	SALWEIN	SALWEIN CR	80	AD 022246	20542	187	0	20729	25.2	05-05-82	05-05-82	HELD 1 DAY
----- T O T A L S F O R COMO -----												
					139776	1698	4100	145574				
WETH	CHILLIWACK	VEDDER R	81	AD 121703	11833	4647	0	16480	115.2	10-05-82	10-05-82	.....
WETH	CHILLIWACK	SLESSE	81	AD 121811	12871	3737	0	16608	100.9	13-05-82	13-05-82	.....
WETH	CHILLIWACK	POLEY CR	81	AD 121917	15452	1163	0	16615	111.2	11-05-82	11-05-82	.....
WETH	CHILLIWACK	CHILLIWACK	81	AD 121918	10479	6207	0	16686	103.6	12-05-82	12-05-82	.....
WETH	CHILLIWACK	CENTRE CR.	82	NOHECC1	0	0	10655	10655	2.0	30-08-82	30-08-82	FED FRY RELEASE
----- T O T A L S F O R WETH -----												
					50635	15754	10655	77064				
----- G R A N D T O T A L S -----												
					571134	22917	4033427	4627478				

Table 4 (cont'd.)

CHILLIWACK RIVER**Assessment:**

- chinook - single CWT group per stock released from the hatchery to evaluate contribution to catch and escapement and particularly to discriminate early-run Pitt and Chilliwack stocks
- an additional group of Pitt River chinook were CWT marked and returned to the Pitt
- chum - planned early (RV) and late (AdLV and LV) releases each of 100,000 marks to determine the effect of release date on survival
- plan disrupted by disease outbreak among late group
- RV group was poor quality at release; AdLV and LV groups were average quality at release
- comparison of AdLV versus LV marked returns will provide data on regeneration of clipped ventral fins
- coho - 9 CWT release groups to determine homing behaviour and survival in relation to release strategy
- release of all 3 stocks from both hatchery and in homestream; in addition some Dolly Varden and Salween coho were held in homestream prior to release

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles	
				Target	Released
Chinook	Chilliwack	1981	Smolt	28,800	4,975
	Pitt	1981	Smolt	54,000	60,365
	Pitt	1981	Fed Fry	54,000	49,300
	Harrison	1981	Smolt	360,000	356,388
Chum	Chilliwack	1981	Fed Fry	3,750,000	3,933,832
Coho	Dolly Varden	1980	Smolt	169,000	45,380
	Salween	1980	Smolt	84,000	62,888
	Post	1980	Smolt	84,000	37,306

Chinook: Chilliwack stock egg target was as many as possible but low production was expected due to weak stock strength. Escapement was extremely low. Pitt river chinook were identified as a high priority enhancement target and as a probable source of eggs for establishing an early-run Chilliwack stock. Egg-take was permitted from one-third of the escapement to a maximum of 30 females. Juveniles were to be released in equal numbers to the Pitt and to the Chilliwack. The Pitt release was at the fed fry stage at the request of management biologists. Harrison chinook were selected as the major chinook production stock for Chilliwack Hatchery until an early-run stock, strong enough to utilize hatchery capacity, could be identified and approved for transport.

Chum: Fed fry production as planned.

Coho: Production was directed at the three major tributary stocks as planned. Egg-takes were less than expected due to brood stock availability.

Table 4 (cont'd)

CORUMA RIVER										PAGE 1	
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCORP'L. UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START BRO DD-MM-YY	DD-MM-YY	COMMENTS
CHUM	CORUMA	CORUMA	81	AD	022203	64484	9721	77795	152000	2.5	12-06-82 15-06-82
----- T O T A L S F O R CHUM -----											
					64484	9721	77795	152000			
CHUM	SUCHOA	SUCHOA	81	LV14		32645	0	992355	1025000	0.9	26-04-82 26-04-82
CHUM	SUCHOA	SUCHOA	81	RV12		32720	2860	496312	531900	0.7	12-04-82 12-04-82
CHUM	CARTON	CARTON CR	81	AD	022206	97738	5252	314610	417600	1.4	16-04-82 16-04-82
CHUM	SUCHOA	SUCHOA	81	AD	022255	28995	6023	478582	513600	1.9	11-04-82 11-04-82
CHUM	SUCHOA	SUCHOA	81	AD	022256	26919	2794	1967287	1997000	0.9	17-05-82 17-05-82
CHUM	TLUPANA	TLUPANA	81	ADRV13		97241	4050	274209	375500	1.7	23-04-82 23-04-82
CHUM	CORUMA	CORUMA	81	MONIE21		0	0	1578000	1578000	1.2	23-04-82 24-04-82
CHUM	CORUMA	CORUMA	81	MONIE22		0	0	2503000	2503000	1.1	27-04-82 28-04-82
CHUM	DESERTED	DESERTED L.	81	MONIE55		0	0	3782200	3782200	1.0	28-04-82 30-04-82
----- T O T A L S F O R CHUM -----											
					316266	20979	12386555	12723800			
COMO	CORUMA	CORUMA	81	RV15		50868	513	0	51381	1.1	23-04-82 23-04-82
COMO	CORUMA	CORUMA	81	MONIE20		0	0	49000	49000	15.3	07-09-82 07-09-82
----- T O T A L S F O R COMO -----											
					50868	513	49000	100381			
----- G R A N D T O T A L S -----											
					431618	31213	12513350	12976181			

CONOMA RIVER

Assessment:

- single CRT group to determine survival to catch and escapement
- all chum marking studies designed with consideration given to determination of rates of straying
- planned to release 5 mark groups as follows:

April 5 - accelerated production (35,000 CRT)

- production (35,000 RV)

April 20 - production (35,000 LW)

- production (35,000 CRT)

May 5 - production (35,000 CRT)

- production (35,000 CRT)

to determine effect of release date on survival; effect of size of fish released April 5 on survival; and to provide data on fin regeneration (LV versus CRT released April 20)

- release dates selected to encompass wild fry timing peak

- study disrupted since production fish were too small to be tagged for mid-April release and

late release group went off feed and suffered significant mortality. Late release group was

eventually tagged (CRT 02-22-56) but fish were poor to average quality.

- Suvoos stock is the production index for Tiupana Inlet off-site fry plants

Canton chum

- single CRT group to determine survival to catch and escapement

- Canton stock was not marked in previous years of hatchery operation

Tiupana chum

- single mark group to determine survival to catch and escapement

Deserted and Conoma chum

- survival of unmarked stocks will be estimated from survival rates for similar marked release

groups (probably Suvoos CRT 02-22-56; Suvoos LV; Canton CRT 02-22-06 but will depend on observed

survival rates)

- marked (RV) upriver fed fry plant to evaluate contribution to escapement

- unmarked fall hatchery release will not be assessed

coho

Production Strategies:

Species	Stock	Brood Year	Stage at Release	Target	No. Juveniles Released
Chinook	Conoma	1981	Smolt	144,000	152,000
Chum	Suvoos	1981	Fed Fry	2,160,000	4,047,500
	Canton	1981	Fed Fry	360,000	417,600
	Tiupana	1981	Fed Fry	360,000	375,500
	Conoma	1981	Fed Fry	2,160,000	4,081,000
	Deserted	1981	Fed Fry	9,040,000	3,782,800
	Total			9,040,000	12,723,800
Ocho	Conoma	1981	Fed Fry	72,000	100,381

Chinooks: Capacity was 2,000,000 eggs (1,440,000 smolts) but production constraints were expected due to low escapement levels.

Chum: Original design was for 3,600,000 fed fry release per stock, except Deserted, which was to be a fed fry release of 2,160,000 (total capacity of 16,400,000 fed fry). Decision to increase Deserted, at least during the rebuilding phase, was based on the fact this stock migrates later and could be fished discretely. Release targets in 1982 reflect this approach and the expected brood stock numbers. Canton, Tiupana and Deserted production was close to expectation whereas Suvoos and Conoma production was about double pre-season forecast. Total production was still only about 75% of design capacity.

Ocho: 1982 was the first year of hatchery coho releases. Plans were to release 72,000 fed fry to the upper river to rebuild the stock and to help compensate for interceptions during the chum fishery. Subsequent reallocation suggested upriver release targets were too high, therefore a pre-summer release of small fry was made above the falls to utilize inaccessible habitat while the remainder were released below the falls in the fall. It was assumed fall-released fry would interact less with wild fry than would earlier released fry.

Table 4 (cont'd)

PAGE 1

FULTON RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
										START	END	
SOCK	FULTON	FULTON CH.	81	MONIES 7	0	0	65600000	65600000	0.1	15-04-82	07-06-82	.....
SOCK	FULTON	FULTON R.	81	MONIES 8	0	0	72700000	72700000	0.1	15-04-82	07-06-82	.....
TOTALS FOR SOCK												
					0	0	138300000	138300000				
GRAND TOTALS												
					0	0	138300000	138300000				

FULTON RIVER

Assessment:

sockeye - project contribution to catch will be estimated based on escapement counts, stock timing data and total Skeena catch

Production Strategies:

Species	Stock	Brood Year	Stage at Release		Mo. Juveniles	
			Release		Target	Released
Sockeye	Fulton	1981	Fry			
			Chan. 1		15,000,000	12,300,000
			Chan. 2		72,000,000	53,300,000
			River		27,000,000	72,700,000
			Total		114,000,000	138,300,000

Sockeye: Production targets were based on estimated spawning area and required area per female. Channel 1 egg deposition was lower than projected. Channel 2 egg deposition was slightly higher than expected but survival to fry was low (26.9%). River deposition was about twice that expected and survival to fry was high (24.6%) resulting in very high fry output.

Table 4 (cont'd)

PAGE 1

INCH CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START DD-MM-YY	END DD-MM-YY	
CHUM	BLAHEY CR	BLAHEY CR	81	AD 022160	34324	3395	836148	873867	1.5	09-03-82	31-03-82	LATE RELEASE
CHUM	BLAHEY CR	BLAHEY CR	81	AD 022224	39311	1504	904780	945595	1.5	09-03-82	31-03-82	EARLY RELEASE
CHUM	INCH	INCH CR	81	NOHE1	0	0	1284194	1284194	1.0	28-04-82	17-05-82	.....
----- T O T A L S F O R CHUM -----												
					73635	4899	3025122	3103656				

COHO	SIDDLE	UPR.SIDDLE	81	AD 022249	32879	1069	5535	39483	3.7	06-07-82	08-07-82	.....
COHO	WICHEN	SIDDLE CR.	81	AD 022251	33535	352	7226	41113	3.4	06-07-82	08-07-82	.....
COHO	INCH	INCH CR	81	NOHE2	0	0	10095	10095	2.7	07-07-82	07-07-82	.....
COHO	MORRISH	MORRISH CR.	81	NOHE3	0	0	4695	4695	2.7	07-07-82	07-07-82	.....
COHO	SQUAKUM	SQUAKUM CR	81	NOHE4	0	0	1000	1000	2.3	17-06-82	17-06-82	.....
----- T O T A L S F O R COHO -----												
					66414	1421	28551	96386				

CUTT	INCH	WICHEN SL.	81	LAKXCC3	10191	0	0	10191	72.8	05-28-82	06-01-82	.....
CUTT	INCH	STAVE R.	81	LAKXCC4	4523	0	0	4523	94.9	03-11-83	03-11-83	.....
CUTT	INCH	INUM/MARSHAL	81	LAKXCC5	5000	0	0	5000	55.0	04-06-82	04-06-82	.....
----- T O T A L S F O R CUTT -----												
					19714	0	0	19714				

----- G R A N D T O T A L S -----												
					159763	6320	3053673	3219756				

Table 4 (cont'd.)

INCH COHO**Assessment:**

- chum - Inch stock
- planned to CWT 3 groups of 35,000 for release on different dates
 - not done due to manpower constraints
 - assessment will be based on return of unmarked fish
- chum - Blaney stock
- planned to CWT 3 groups of 40,000 representing different release strategies
 - plan abandoned due to increasing fry mortality during marking
 - released 2 groups on different dates
 - release dates represent beginning and end of a trickle release
- coho - all stocks
- marked only Bell and Nicomen coho; other populations too small
 - purpose to evaluate contribution of fed fry plants
 - contribution of unmarked stocks will be estimated from that of marked stocks

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles	
				Target	Released
Chum	Inch	1981	Fed Fry	1,440,000	1,284,194
	Blaney	1981	Fed Fry	1,440,000	1,019,462
	Stave	1981	Fed Fry	1,440,000	0
	Total			4,320,000	3,103,656
Coho	Inch	1981	Fed Fry	73,000	10,095
	Nicomen	1981	Fed Fry	36,000	41,113
	Siddle	1981	Fed Fry	61,000	39,483
	Morrish	1981	Fed Fry	16,000	4,695
	Squakum	1981	Fed Fry	16,000	1,000
	Total			202,000	96,386

Chum: Plan was approximately equal enhancement of the Inch, Blaney and Stave stocks but with the option of reduced production of Blaney stock and increased production of Stave stock. No Stave stock was taken due to manpower restrictions.

Coho: All coho stocks identified by the GNG were enhanced but production fell short of target due to low escapement levels and manpower restrictions.

Table 4 (cont'd)

JONES CREEK												PAGE 1
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START	END	
CHUM	JONES	JONES CR	81	HOWE26	0	0	251400	251400	0.4	25-03-82	10-06-82	.....
----- T O T A L S F O R C H U M -----												
					0	0	251400	251400				-----
PINK	JONES	JONES CR	81	HOWE27	0	0	1572400	1572400	0.3	09-04-82	10-06-82	.....
----- T O T A L S F O R P I N K -----												
					0	0	1572400	1572400				-----
----- G R A N D T O T A L S -----												
					0	0	1823800	1823800				-----

JONES CREEK

Assessment:

chum, pink

- no marking
- assessment will be based on return of unmarked fish
- chum are incidental to pink production

Production Strategies:

Species	Stock	Brood Year	Stage at Release	
			Target	Released
Chum	Jones	1981	168,000	251,000
Pink	Jones	1981	1,200,000	1,572,000

Chum: Production in the spawning channel is incidental to pink production.

Pink: Production as planned.

Table 4 (cont'd)

KALUM												PAGE 1	
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS	
						INCOMPL.	UNMARK			START DO-MM-YY	END DO-MM-YY		
CHIN	CRD/CLR	CEDAR CR	81	AD	022149	16204	163	12433	28800	1.9	27-04-82	28-04-82	UNHEATED WATER
CHIN	CRD/CLR	CLEAR R.	81	AD	022311	18937	191	8872	28000	1.8	20-04-82	22-04-82	HEATED WATER
CHIN	KALUM	KALUM R	81	AD	022312	23234	235	6781	30250	1.4	05-05-82	06-05-82	UNHEATED WATER
CHIN	KALUM	KALUM R	81	AD	022313	29459	298	40643	70400	1.4	05-05-82	06-05-82	HEATED WATER
TOTALS FOR CHIN						87834	887	68729	157450				
GRAND TOTALS						87834	887	68729	157450				

KALUM

Assessment:

chinook - planned to release 4 CWT groups with 30,000 marks per group to evaluate benefits of heating water for chinook rearing as follows:

- Clear River stock - large (heated water) versus small (ambient water) release size
- Kalium River stock - large (heated water) versus small (ambient water) release size
- plan disrupted due to inadequate water heating system (therefore no significant size differences were achieved within each stock), and many fish did not reach taggable size early enough to tag planned numbers
- for evaluation CWT 02-21-49 and 02-23-11 will be combined and CWT 02-23-12 and 13 will be combined

Production Strategies:

Species	Stock	Brood Year	Stage at Release	
			Target	Released
Chinook	Cedar	1981	Ped Fry	56,800
	Clear	1981	Ped Fry	
	Kalium	1981	Ped Fry	100,650

Chinook: The original plan was to take a total of 100,000 eggs with release of 72,000 smolts. This was increased to 200,000 eggs in discussion with the GWC. The eggs were to be 50% upriver (Cedar, Clear) stock and 50% Kalium stock. Upriver fish were desirable because they are early (resulting in larger smolts released from the hatchery) and adult returns could be easily monitored using inexpensive fences. The lower river stock, Kalium, was a larger stock from which to take eggs and offered an opportunity to release smaller smolts at the same time as the upriver stocks were released. Since the intent of the pilot was to compare growth and post-release survival of chinook reared at ambient and heated water temperatures, the potential size differences and the ability to monitor escapement were important considerations.

Table 4 (cont'd)

PAGE 1

KITIMAT

SPECIES	STOCK	RELEASE SITE	BLOOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START DD-WW-YY	END DD-WW-YY	
CHIN	KITIMAT	KITIMAT	81	AD 021961	10205	155	68000	78360	4.4	04-06-82	07-06-82	PILOT 2
CHIN	HIRSON	HIRSON R	81	AD 022137	19313	1307	0	20620	5.4	13-05-82	14-05-82	PILOT 1
CHIN	KITIMAT	KITIMAT	81	AD 022232	42110	8390	9990	60490	6.5	10-05-82	13-05-82	PILOT 1
TOTALS FOR CHIN					71628	9852	77990	159470				
CHUM	KITIMAT	KITIMAT	81	MON29	0	0	30345	30345	2.7	28-03-82	18-04-82	PILOT 2
TOTALS FOR CHUM					0	0	30345	30345				
COMO	KITIMAT	KITIMAT TRIS	81	MON230	0	0	54000	54000	1.6	18-05-82	21-05-82	PILOT 2
TOTALS FOR COMO					0	0	54000	54000				
STND	CHIST	KITIMAT	82	MON26	0	0	25600	25600	1.5	01-10-82	01-10-82	PILOT 1
TOTALS FOR STND					0	0	25600	25600				
GRAND TOTALS					71628	9852	187935	269415				

KITIMAT**Assessment:**

- Chinook - Hirsch and Kitimat mainstem stocks marked discretely to evaluate stock integrity and contribution
- Kitimat stock reared at two different pilot sites marked discretely to evaluate relative survival
- chum - no assessment
- coho - no assessment

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Release		Target	Released
Chinook	Kitimat	1981	Smolt	]	100,000	138,850
	Hirsch	1981	Smolt			20,620
Chum	Kitimat	1981	Fed Fry		36,000	30,345
Coho	Kitimat	1981	Fed Fry		36,000	54,000

Chinook: Top priority for the pilot operation was continued production of Kitimat system (includes Hirsch) stocks. Kitimat mainstem and Hirsch stocks were kept separate through the fish culture process and were released to the stream of origin. Two pilot sites were operated.

Chum: Minor egg-takes were approved to provide background data using the Pilot 2 site in preparation for large-scale production when the major hatchery became operational.

Coho: Minor egg-take as for chum.

Table 4 (cont'd)

LITTLE QUALICUM												PAGE 1
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START	END	
CHIN	NO QUALICUM LT QUALICUM	81	AD	022419	81112	1068	1328977	1411157	7.0	11-06-82	11-06-82	.....
----- T O T A L S F O R CHIN -----												
					81112	1068	1328977	1411157				
CHUM	LT QUALICUM LT QUALICUM	81	LV17		91392	8164	2648253	2747809	0.7	07-05-82	14-05-82	PRD PRY RELEASE
CHUM	LT QUALICUM LT QUALICUM	81	ADLP16		230069	21648	1195160	1446877	0.4	15-04-82	01-05-82	PRY RELEASE
----- T O T A L S F O R CHUM -----												
					321461	29812	3843413	4194686				
STND	WILD-BQR LT QUALICUM	81	AD121707/8		17964	837	6811	25612	54.3	07-04-82	07-04-82	CWT121708 INCLD
----- T O T A L S F O R STND -----												
					17964	837	6811	25612				
----- G R A N D T O T A L S -----												
					420537	31717	5179201	5631455				

LITTLE QUALICUM

Assessment:

- single CWT group to determine survival to catch and escapement
- unfed fry marked (AdLV) to determine survival of unfed channel fry
- fed fry marked (LV) to evaluate effect of rearing on post-release survival

Production Strategies:

<u>Species</u>	<u>Stock</u>	<u>Brood Year</u>	<u>Stage at Release</u>	<u>No. Juveniles</u>	
				<u>Target</u>	<u>Released</u>
Chinook	Big Qualicum	1981	Smolt	1,500,000	1,411,157
Chum	Little Qualicum	1981	Fry	13,000,000	1,446,877
		1981	Fed Fry	5,000,000	2,747,809

Chinook: Smolt production from fry transplanted from Big Qualicum as planned. Proposal to double chinook production was approved by CMG but facilities were not expanded to handle increased numbers.

Chum: Spawning channel capacity is 75,000,000 eggs but we projected natural spawning would contribute only 15,000,000 eggs due to low escapement and avoidance of the channel. A lower river egg-take of 10,000,000 eggs with transfer of eggs to the channel was planned to supplement natural egg deposition. As expected, channel fishway avoidance was a problem and although large numbers of adults accumulated below the fence, most migrated upriver when high flows eroded a channel around the fence. The supplementary egg-take was a failure (only 92,000 eggs were taken) due to low escapement and flooding. We projected (pre-season) 19,000,000 fry would be produced in the channel from a 25,000,000 egg deposition (natural spawning plus egg-take) and 6,000,000 fry would be transferred to rearing pens. In fact, egg deposition was very low, and only 4,219,000 fry were produced. Of these 2,772,126 were transferred to rearing pens and reared with final release of 2,748,000 fed fry. Chum rearing facilities were not expanded to handle 5,000,000 fed fry as originally intended as a result of the low egg deposition.

Table 4 (cont'd)

LOON CREEK

PAGE 1

SPECIES STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPLETE	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
								START	END	
								DD-MM-YY	DD-MM-YY	
CHIN	NICOLA	81	AD 022415	23280	720	0	24000	26-04-82	30-04-82	UP. NICOLA REL.
CHIN	NICOLA	81	AD 022416	7050	490	6800	14300	26-04-82	30-04-82	LOW. NICOLA REL.
CHIN	BONAPARTE	81	AD 022417	29100	900	0	30000	26-04-82	30-04-82	UP. BONAPARTE REL.
CHIN	BONAPARTE	81	AD 022418	15360	640	0	16000	26-04-82	30-04-82	LOW. BONAPARTE REL.
CHIN	BONAPARTE	81	MONCH2	0	0	6500	6500	26-04-82	30-04-82	LOW. BONAPARTE REL.
TOTALS FOR CHIN										
				74790	2710	13300	90800			
GRAND TOTALS										
				74790	2710	13300	90800			

LOON CREEK

Assessment:

Bonaparte and Nicola chinook

- 2 CWT release groups per stock to evaluate upper and lower stocking sites in each river system
- returns from 6500 unmarked Bonaparte stock which were too small to tag may be estimated from relative survival rates of CWT 02-24-15 versus 02-24-17 and 02-24-18 applied to CWT 02-24-16
- planned to mark 30,000 fish per CWT group but inadequate number of fish

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Release		Target	Released
Chinook	Bonaparte	1981	Fed Fry		150,000	52,500
	Nicola	1981	Fed Fry		-	38,300

Chinook: Target production at the Provincial facility was 150,000 fed fry release of Bonaparte stock. The CMG agreed to supplementation of the egg-take to capacity using Nicola and Deadman stocks as required with return of these stocks to their homestream at the time of release.

Table 4 (cont'd)

PAGE 1

MATHERS									
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)
CHUM	MATHERS	MATHERS	81	LW19	40869	2412	396316	439597	0.7
CHUM	MATHERS	MATHERS	81	RV18	40324	352	38279	78955	2.4
TOTALS FOR CHUM:					81193	2764	434595	518552	
GRAND TOTALS									
					81193	2764	434595	518552	

Assessment:

- 2 mark groups to evaluate effect of groundwater incubation and rearing versus surface water incubation and rearing on post-release survival

Production Strategies:

Species	Stock	Brood Year	Stage at Release	Mo. Juveniles Target	Released
Chum	Mathers	1981	Fed Fry	320,000	518,552

Chum: Pilot capacity is approximately 1,000,000 eggs but projected egg-take was only 500,000 due to low population level. Incubation and rearing were on both ground and surface water as planned but most fish were on surface water.

Table 4 (cont'd)

MITINAT										PAGE 1	
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START END	COMMENTS
CHIN	MITINAT	MITINAT	81	AD 022204	86435	1109	404080	491624	5.3	13-06-82 19-06-82	.....
----- T O T A L S F O R CHIN -----											
					86435	1109	404080	491624			

CHUM	MITINAT	MITINAT	81	LV20	72092	1025	6747461	6820578	1.0	07-04-82 14-04-82	
CHUM	MITINAT	MITINAT	81	RV24	74214	574	6632358	6707146	1.4	25-05-82 25-05-82	
CHUM	MITINAT	MITINAT	81	ADLV23	74305	1053	2229478	2304836	1.2	15-05-82 15-05-82	
CHUM	MITINAT	MITINAT	81	ADRV21	71327	1032	6767525	6839884	0.7	15-04-82 15-04-82	
CHUM	MITINAT	MITINAT	81	MOHEPC22	0	0	4506088	4506088	1.1	06-05-82 06-05-82	REL UNREP.
----- T O T A L S F O R CHUM -----											
					291938	3684	36882910	27178532			

----- G R A N D T O T A L S -----											
					378373	4793	27266990	27670156			

MITINATAssessment:

- single CRT group to determine survival to catch and escapement
- planned to release fish of similar size on four different dates to evaluate effect of time of release on survival
- dates for release selected to encompass wild fry timing peak
- study disrupted due to water supply failure which necessitated premature release of release group 2
- unmarked, unrepresented release group survival will be estimated from survival of most similar marked release group

Production Strategies:

<u>Species</u>	<u>Stock</u>	<u>Brood Year</u>	<u>Stage at Release</u>	
			<u>Target</u>	<u>Released</u>
Chinook	Witinat	1981	360,000	491,624
Chum	Witinat	1981	7,200,000	27,178,532

Chinook: Capacity is 1,500,000 eggs but an egg-take of 500,000 was projected based on low escapement levels. Production slightly exceeded expectations.

Chum: Hatchery capacity is 28,000,000 eggs (20,160,000 fed fry) but egg-take was slightly greater than design capacity (29,522,000) and survival to release was extremely high with the resultant release of over 27,000,000 juveniles. This is the largest single Canadian hatchery release in history. We expected, incorrectly, that production would be limited by brood stock availability. Over-capacity rearing populations were to be managed through sequential releases and this was done, but the release schedule was disrupted due to a major water supply failure.

Table 4 (cont'd)

PALLANT CREEK												
SPECIES	STOCK	RELEASE SITE	BLOOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START DO-MO-YY	END DO-MO-YY	
PALLANT CREEK												
CHUM	PALLANT	DEER WAY	81	AD 022144	30286	307	36269	39262	2.9	05-05-82	05-05-82	
CHUM	PALLANT	DEER WAY	81	AD 022146	24521	1296	371832	397649	2.9	13-05-82	13-05-82	
CHUM	PALLANT	DEER WAY	81	AD 022148	6112	325	0	6437	2.9	13-05-82	13-05-82	
CHUM	PALLANT	DEER WAY	81	WOM337	0	0	1648122	1648122	1.1	05-05-82	05-05-82	
CHUM	PALLANT	DEER WAY	81	WOM338	0	0	807235	807235	1.1	12-05-82	12-05-82	
CHUM	PALLANT	DEER WAY	81	WOM339	0	0	403058	403058	1.0	21-04-82	21-04-82	
CHUM	PALLANT	DEER WAY	81	WOM340	0	0	1350371	1350371	0.7	13-05-82	13-05-82	
CHUM	PALLANT	DEER WAY	81	WOM341	0	0	811712	811712	1.0	14-04-82	14-04-82	
CHUM	PALLANT	DEER WAY	81	WOM342	0	0	588074	588074	1.8	25-04-82	25-04-82	
CHUM	PALLANT	DEER WAY	81	WOM343	0	0	801469	801469	1.1	29-04-82	29-04-82	
TOTALS FOR CHUM												
					60919	1928	714542	7207389				
PALLANT CREEK												
COHO	PALLANT	MOSQUITO	81	AD 022402	31282	557	36184	68023	4.9	24-06-82	26-06-82	MOSQ. LK. REL.
COHO	PALLANT	MOSQUITO	81	WOM344	0	0	32689	32689	2.9	22-06-82	24-06-82	MOSQ. CR. REL.
COHO	PALLANT	PALLANT	81	WOM345	0	0	45571	45571	3.5	25-06-82	27-06-82	HATCHERY RELEASE
COHO	PALLANT	PALLANT	81	WOM346	0	0	46574	46574	3.2	21-06-82	25-06-82	UP. PALLANT REL.
TOTALS FOR COHO												
					31282	557	161018	192857				
PALLANT CREEK												
BTND	PALLANT	PALLANT	81	RMAX25	4171	0	957	5128	1.7	22-07-82	23-07-82	
TOTALS FOR BTND												
					4171	0	957	5128				
GRAND TOTALS												
					96372	2485	7306517	7405374				

Table 4 (cont'd.)

PALLANT CREEK**Assessment:**

- chum
- planned to release 3 CWT groups each 40,000 tags on 3 different dates selected to encompass wild fry timing peak to evaluate the effect of release date on survival
 - study disrupted due to slow fry growth which reduced time available to tag fish prior to specified release dates
- coho
- contribution of unmarked, unrepresented release groups will be estimated based on survival of marked release groups' total escapement, and accumulated observations from Pallant and other projects on the relative survival of fish released at different sizes and dates
 - planned to release 2 CWT groups each 40,000 marks to evaluate effect of release areas on survival but marking was disrupted due to high water temperatures
 - survival of unmarked, unrepresented groups will be estimated based on total escapement and observed survival for previous releases relative to release sites

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles	
				Target	Released
Chum	Pallant	1981	Fed Fry	1,440,000	7,207,389
Coho	Pallant	1981	Fed Fry	216,000	192,857

Chum: Plan was to take as many as possible to 7,000,000 eggs but a shortfall was expected (2,000,000 egg-take) due to low escapement. Production exceeded expectations.

Coho: Fed fry plants were intended to utilize upper Pallant and Mosquito Lake habitat. About 25% of the fry were released from the hatchery due to signs of high temperature stress in the lake-planted population and because we wished to seed the lower river.

Table 4 (cont'd)

PENNY													PAGE 1
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS	
CHIN	SLIM	SLIM CR	81 AD	022317	26287	1530	3524	31341	1.6	29-07-82	29-07-82	NO HOLDING	
CHIN	SLIM	SLIM CR	81 AD	022318	26533	680	8504	35717	1.3	29-07-82	29-07-82	7 DAYS HOLDING	
CHIN	BORON	BORON R	81 AD	022319	34017	1234	5302	40553	1.2	23-07-82	23-07-82	7 DAYS HOLDING	
CHIN	BORON	BORON R	81 AD	022320	31851	485	11546	43882	1.2	23-07-82	23-07-82	NO HOLDING	
TOTALS FOR CHIN					116688	3929	28876	151493					
GRAND TOTALS					116688	3929	28876	151493					

PENNY

Assessment:

Slim and Boron chinook

- 2 CVT groups per stock to evaluate effect of holding (5-7 days) versus no holding at time of release in homestream on survival and homing

Production Strategies:

Species	Stock	Brood Year	Stage at Release	
			Target	No. Juveniles Released
Chinook	Slim	1981	72,000	67,058
	Boron	1981	72,000	84,435

Chinook: This pilot program to evaluate fish culture success using cold water supplies, was expanded in 1981. Original plans were to produce Torpy and Wokill chinook at Penny, and Boron and Slim chinook at Quesnel hatchery. However, because of constraints at Quesnel hatchery and the excessive costs associated with obtaining Torpy and Wokill broodstock, plans were amended to produce Slim and Boron chinook at Penny.

Table 4 (cont'd)

PINKUT CREEK											PAGE 1	
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
						INCOMPL.	UNMARK			START DD-MM-YY	END DD-MM-YY	
SOCK	PINKUT	PINKUT CR.	81	MONIES9	0	0	57700000	57700000	0.1	15-04-82	07-06-82	.....
SOCK	PINKUT	PINKUT CR	81	MONIES0	0	0	42000000	42000000	0.1	15-04-82	07-06-82	.....
T O T A L S F O R S O C K												
					0	0	99700000	99700000				
G R A N D T O T A L S												
					0	0	99700000	99700000				

PINKUT CREEK

Assessment:

sockeye - project contribution to catch will be estimated based on escapement counts, stock timing data and total Skeena catch

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Released		Target	Released
Sockeye	Pinkut	1981	Fry			
			Channel		45,000,000	57,700,000
			River		3,000,000	20,400,000
			Upper river		-	21,600,000

Sockeye: Targets are based on available spawning area and expected egg-to-fry survival. Egg deposition in the channel was less than capacity (69,600,000 versus 90,000,000) but survival was exceptionally high (82.9%). Over-escapement to Pinkut Creek resulted in very high egg deposition (81,800,000 versus 27,000,000 optimum) but survival to fry was good (24.9%). The above production and survival estimates for the creek are complicated by transport of sockeye adults to the river above the falls, where they spawned. We planned to airlift 50,000 adults if escapement was excessive; in fact we transferred 91,000 adults. Resultant fry mixed with the lower river fry above the counting fence. It was assumed survival during incubation was equal above and below the falls.

Table 4 (cont'd)

PUNTLAGE RIVER											PAGE 1
SPECIES	STOCK	RELEASE SITE	BLOOD YEAR	MARK	MARKED	NO. RELEASED INCOMPLETE	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START END	COMMENTS
CHUM	PUNT-FALL	PUNTLAGE	81	AD 022263	42100	375	22218	64593	4.6	15-06-82 15-06-82	LATE RELEASE
CHUM	PUNT-FALL	PUNTLAGE	81	AD 022301	41952	338	0	42290	4.0	01-06-82 01-06-82	EARLY RELEASE
CHUM	PUNT-SUMMER	PUNTLAGE	81	AD 022302	50383	1211	140412	200006	6.3	14-06-82 14-06-82	.....
T O T A L S FOR CHUM											
					134435	1824	170630	306089			
CHUM	PUNTLAGE	PUNTLAGE	81	AD 022252	37278	568	649169	687015	0.6	30-04-82 30-04-82	EARLY RELEASE
CHUM	PUNTLAGE	PUNTLAGE	81	AD 022253	34885	603	699548	735036	1.0	12-05-82 12-05-82	MID RELEASE
CHUM	PUNTLAGE	PUNTLAGE	81	AD 022254	36116	0	865225	901341	0.9	28-05-82 28-05-82	LATE RELEASE
CHUM	PUNTLAGE	PUNTLAGE	81	NONREC2	0	0	45686	0.8	05-06-82 05-06-82	EXP. SUBSTR. GRP.	
T O T A L S FOR CHUM											
					108279	1171	2259628	2369078			
COMO	PUNTLAGE	PUNTLAGE	80	AD 022235	20802	732	303021	324555	21.4	07-05-82 07-05-82	LT. SPWN. PROGRY
COMO	PUNTLAGE	PUNTLAGE	80	AD 022236	18835	1202	321675	341712	20.2	07-05-82 07-05-82	MID. SPWN. PROGRY
COMO	PUNTLAGE	PUNTLAGE	80	AD 022237	17694	1665	315635	334994	18.9	06-05-82 06-05-82	EAR. SPWN. PROGRY
COMO	PUNTLAGE	CRUCKSHANK	81	AD 022262	38034	0	459374	497408	2.5	08-06-82 15-06-82	FED FRY RELEASE
COMO	PUNTLAGE	COMOX LAKE	81	AD 022363	33541	339	1627868	1661748	2.5	15-06-82 21-06-82	FED FRY RELEASE
COMO	PUNTLAGE	UPR. PUNT.	81	AD 022401	34759	351	423787	458897	2.5	18-06-82 25-06-82	FED FRY RELEASE
COMO	PUNTLAGE	UPR. PUNT.	81	NONREC4	0	0	122134	122134	2.5	13-06-82 20-06-82	FED FRY RELEASE
COMO	PUNTLAGE	BEVAN CR	81	NONREC5	0	0	20510	20510	2.5	15-06-82 15-06-82	FED FRY RELEASE
T O T A L S FOR COMO											
					163665	4289	3594004	3761958			
PINK	TSOLUN	TSOLUN	81	ADLVCC1	59529	562	538799	598890	0.2	14-03-82 14-04-82	FRY RELEASE
PINK	TSOLUN	COMOX BAY	81	ADRVCC1	26800	2813	0	29613	0.6	18-03-82 18-05-82	ESTUARY REARED
PINK	TSOLUN	PUNTLAGE	81	LVCCT	53859	2479	0	56338	0.6	05-05-82 05-05-82	ESTUARY REARED
PINK	PUNTLAGE	PUNTLAGE	81	NONREC2	0	0	50404	50404	0.2	28-03-82 01-04-82	FED FRY RELEASE
PINK	PUNTLAGE	PUNTLAGE	81	NONREC3	0	0	50176	50176	0.9	18-04-82 18-04-82	ESTUARY REARED
PINK	TSOLUN	COMOX BAY	81	NONREC3	0	0	26890	26890	0.9	18-04-82 18-04-82	ESTUARY REARED
PINK	PUNTLAGE	PUNTLAGE	81	NONREC3	0	0	819718	819718	0.2	28-01-82 01-04-82	FRY RELEASE
PINK	TSOLUN	COMOX BAY	81	RVCCT	23031	6582	0	29613	0.6	18-05-82 18-05-82	ESTUARY REARED
T O T A L S FOR PINK											
					163219	12436	1485987	1661642			
SETH	PUNTLAGE	PUNTLAGE	81	AD 121948	22259	4209	0	26468	19.8	27-05-82 29-05-82	.....
SETH	PUNTLAGE	PUNTLAGE	82	NONREC1	0	0	20436	20436	1.0	15-06-82 15-06-82	.....
T O T A L S FOR SETH											
					22259	4209	20436	46904			

Table 4 (cont'd)

PAGE 2

PUNTLIDGE RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS	
										START	END		
WETH	PUNTLIDGE	PUNTLIDGE	81	AD	121949	38390	569	0	38959	46.3	23-05-82	23-05-82	.....

T O T A L S F O R W E T H													
						38390	569	0	38959				-----

G R A N D T O T A L S						630247	24498	7530685	8185430				-----

PUNTLIDGE RIVER

Assessment:

- Chum
 - 3 CRT groups to evaluate effect of date of release on survival for fry of similar size
 - release dates selected to encompass wild fry timing peak
- cobo
 - smolts: 3 CRT groups representing timing of parental maturation
 - fed fry: 3 CRT groups representing 3 major upriver colonization areas
 - survival of unrepresented fed fry release groups will be estimated from survival of marked fed fry
 - coho smolts were good quality at release despite minor incidence of cataract
- Tsolum pink
 - mark release designed to compare survival of unfed fry (AdLV) versus fed fry (all other clupe); effect of date of release on survival of fed fry (LV versus RV and AdRV); and to provide some data on ventral fin clip regeneration (RV versus AdRV)
 - LV group suffered minor early rearing disease problem (not identified); other pink groups were healthy
- Puntledge pink
 - no marking
 - survival will be estimated from survival of Tsolum pink releases
- fall chinook
 - 2 CRT groups to evaluate effect of release date on survival
 - both CRT groups are representative of "production"
- summer chinook
 - single CRT group to determine contribution to catch and escapement

Production Strategies:

<u>Production Strategies:</u>				<u>No. Juveniles</u>	
<u>Species</u>	<u>Stock</u>	<u>Brood Year</u>	<u>Stage at</u>	<u>Target</u>	<u>Released</u>
			<u>Release</u>		
Chinook	Puntledge	1981	Smolt	360,000	106,883
	Fall-run	1981	Smolt	1,440,000	200,006
	Summer-run				
Chum	Puntledge	1981	Fed Fry	6,000,000	2,369,078
Coho	Puntledge	1980	Smolt	550,000	1,001,261
		1981	Fry	5,600,000	2,760,697

Pink	Puntledge	1981	Fry	320,000	819,718
		1981	Red Fry	80,000	100,580
	Tsolum	1981	Fry	3,000,000	598,890
		1981	Red Fry	250,000	162,454

Chinook: Full-run chinook design capacity is 4,000,000 smolts but expected production was only 360,000 due to low escapement levels.

Summer-run chinook design capacity is 1,000,000 smolts. Targets were increased to a maximum 2,500,000 smolts with an expectation of 1,440,000 smolts (based on projected brood stock availability) to partially offset low fall chinook production levels.

Both chinook runs were very poor.

Chum: There were uncertainties as to whether the hatchery could support eggs and fry to yield 6,000,000 reared fish but final consensus was that the target was reasonable. Production was less than planned due to low adult escapement.

Coho: Targets reflect design rearing capacity but the balance between smolt and fry releases was to remain flexible until coho egg-takes reached full capacity (7,000,000). Smolt production of about 1,000,000 fish would continue until numbers of fry available for planting in the upper watershed reached 5,600,000. This was feasible since the coho rearing channels were capable of supporting more than the design target of 550,000 smolts. Fry released to the upper watershed were reared to 2.5 g before release to increase their subsequent survival and to further compensate for lower than target release numbers. Rearing of coho fry prior to release upriver is possible only as long as fall chinook production is less than capacity.

Pink: Release target numbers reflect capacity, but fall Tsolum production was dependent on using raceways at the Tsolum site for incubation that were designed for rearing. Previous attempts to raise pinks were not very successful, particularly during freshwater rearing, but also during incubation. For this reason a number of strategies were planned including: incubation of Tsolum stock at Tsolum and Puntledge (to investigate poor incubation results at Puntledge); freshwater rearing of Tsolum stock at Puntledge and Tsolum (to investigate poor results obtained rearing Puntledge stock); saltwater rearing of both Tsolum and Puntledge stocks; fry release of both stocks. Puntledge pink egg-take was close to target but Tsolum egg-take was low due to poor escapement. Puntledge fry were released directly to the river (819,718); reared in freshwater (50,404); or reared in seapens (50,176). Tsolum eggs were incubated to the eyed stage at Puntledge then incubated to the fry stage at Puntledge or Tsolum. Tsolum fry produced at Puntledge were either released unfed to the Tsolum or seapen-reared then released. Tsolum fry produced at Tsolum were released directly without rearing or seapen-reared then released.

Table 4 (cont'd)

QUESNEL RIVER											PAGE 1			
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS		
						INCOMPLETE	UNMARK			START DD-MM-YY	END DD-MM-YY			
CHIN	QUESNEL	QUESNEL	81	AD	021903	5592	212	5000	10804	2.2	03-05-82	03-05-82	RED/WHITE CROSS	
CHIN	QUESNEL	QUESNEL	81	AD	022247	24456	929	0	25385	5.0	03-05-82	03-05-82	WHITE	
CHIN	QUESNEL	QUESNEL	81	AD	022248	25529	894	0	26423	4.3	03-05-82	03-05-82	RED	
TOTALS FOR CHIN											62612			
						55577	2035	5000						
						GRAND TOTALS								
						55577	2035	5000					62612	

QUESNEL RIVERAssessment:

chinook - 3 CWT groups to evaluate whether red and white-fleshed chinook are discrete stocks and whether flesh colour must be considered for brood stock collection and enhancement

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Release		Target	Released
Chinook	Quesnel	1981	Smolt		54,000	62,612
	Quesnel	1981	Yearling Smolt		50,000	0
	Cariboo	1981	Smolt		54,000	0
	Moree/ly	1981	Smolt		54,000	0
	Blackwater	1981	Smolt		54,000	0
	Cottonwood	1981	Smolt		54,000	0
	Willow	1981	Smolt		54,000	0
	Slim	1981	Smolt		54,000	0
	Bowron	1981	Smolt		54,000	0

Chinook: Original plans to enhance a number of stocks using Quesnel Hatchery were disrupted due to late operational startup and budget constraints. Operations were contracted to a private firm. Bowron and slim production was transferred to the Penny facility. Quesnel chinook were divided into three groups - red fleshed, white fleshed and hybrids.

Table 4 (cont'd)

QUINEAM											PAGE	
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPLETE	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	RELEASE DATE END DD-MM-YY	COMMENTS	
CHIN	QUINEAM	QUINEAM	81	AD	022303	49802	150	130221	180173	8.2	14-05-82 14-05-82	EARLY RELEASE
CHIN	QUINEAM	QUINEAM	81	AD	022304	49953	251	208029	258233	7.9	04-06-82 04-06-82	LATE RELEASE
CHIN	QUINEAM	QUINEAM	81	AD	082119	6740	470	0	7210	2.2	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082120	9215	212	0	9427	2.4	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082121	8782	220	0	9002	2.2	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082122	9761	256	0	10017	2.7	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082123	10070	178	0	10248	2.9	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082124	10108	164	0	10272	3.2	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082125	9539	867	0	10406	3.7	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082126	9754	667	0	10421	3.7	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082127	9622	675	0	10297	3.3	05-05-82 05-05-82	TIME SIZE 1ST REL
CHIN	QUINEAM	QUINEAM	81	AD	082128	9434	708	0	10142	5.3	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082129	9590	581	0	10171	5.2	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082130	9072	865	0	9937	5.5	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082131	10184	186	0	10370	6.9	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082132	10302	160	0	10462	6.9	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082133	9776	213	0	9989	6.7	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082134	10205	100	0	10305	8.4	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082135	10394	106	0	10500	8.1	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082136	10169	0	0	10169	8.2	26-05-82 26-05-82	TIME SIZE 2ND REL
CHIN	QUINEAM	QUINEAM	81	AD	082137	9478	653	0	10131	8.4	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082138	9763	610	0	10373	7.8	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082139	9400	559	0	9959	7.3	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082140	10022	207	0	10229	10.4	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082141	10417	181	0	10598	9.6	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082142	9739	229	0	9968	8.9	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082143	10602	0	0	10602	11.2	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082144	10119	0	0	10119	12.3	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082145	10059	90	0	10149	10.5	16-06-82 16-06-82	TIME SIZE 3RD REL
CHIN	QUINEAM	QUINEAM	81	AD	082146	9074	734	0	9808	10.2	07-07-82 07-07-82	TIME SIZE 4TH REL
CHIN	QUINEAM	QUINEAM	81	AD	082147	9249	881	0	10130	9.8	07-07-82 07-07-82	TIME SIZE 4TH REL
CHIN	QUINEAM	QUINEAM	81	AD	082149	9578	171	0	9749	13.4	07-07-82 07-07-82	TIME SIZE 4TH REL
CHIN	QUINEAM	QUINEAM	81	AD	082150	6859	129	0	6988	12.8	07-07-82 07-07-82	TIME SIZE 4TH REL
CHIN	QUINEAM	QUINEAM	81	AD	082152	9704	0	0	9704	16.5	07-07-82 07-07-82	TIME SIZE 4TH REL
CHIN	QUINEAM	QUINEAM	81	AD	082153	9206	0	0	9206	15.7	07-07-82 07-07-82	TIME SIZE 4TH REL
TOTALS FOR CHIN												
					415741	11473	330250		765464			
CHUM	QUINEAM	QUINEAM	81	NONRE25	0	0	71565	71565	0.9	09-06-82 09-06-82	ESTUARY REARED	
TOTALS FOR CHUM												
					0	0	71565	71565				
COHO	QUINEAM	QUINEAM	80	AD	022227	19501	118	246935	266554	25.2	18-05-82 02-06-82	1 EYE GOOD
COHO	QUINEAM	QUINEAM	80	AD	022228	18835	152	234947	25434	23.3	18-05-82 02-06-82	1 EYE GOOD
COHO	QUINEAM	QUINEAM	80	AD	022229	19050	173	200916	220139	23.3	18-05-82 02-06-82	1 EYE GOOD

Table 4 (cont'd)

QUINSAM

PAGE 2

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS		
						INCOMPL.	UNMARK			START DD-MM-YY	END DD-MM-YY			
CORO	QUINSAM	QUINSAM	80	AD	022230	18852	145	516207	535204	24.0	15-05-82	02-06-82	BLIND	
CORO	QUINSAM	UPR QUINSAM	81	NONE51	0	0	0	263000	263000	10.0	15-09-82	17-09-82	COLONIZATION	
T O T A L S F O R C O R O										76238	588	1462005	1538831	
PINK	QUINSAM	CAMP. ESTURY	81	LV4	30022	0	62266	92268	0.5	30-04-82	30-04-82	LATE RELEASE		
PINK	QUINSAM	CAMP. ESTURY	81	RV3	60394	0	66600	126994	0.3	16-04-82	16-04-82	EARLY RELEASE		
PINK	QUINSAM	CAMP. ESTURY	81	ADLV5	30124	0	0	30124	0.4	30-04-82	30-04-82	LATE RELEASE		
PINK	QUINSAM	QUINSAM	81	ADRV6	60525	0	3232817	3293342	0.2	23-03-82	20-04-82	FRY RELEASE		
PINK	QUINSAM	BEAR R	81	NONE56	0	0	1819812	1819812	0.2	02-05-82	13-05-82	TRANSPLANT		
T O T A L S F O R P I N K										181065	0	5181495	5362560	
STND	QUINSAM	QUINSAM	81	AD	121950	17405	184	0	17589	77.8	18-04-82	25-05-82		
STND	QUINSAM	UPR QUINSAM	82	LMAX2	14060	0	14060	29200	5.1	15-09-82	15-09-82	.....		
STND	SALMON R.	SALMON R.	82	NONE23	0	0	44613	44613	0.8	28-07-82	28-07-82	.....		
STND	QUINSAM	QUINSAM	82	LMAX1	15000	0	3000	18000	5.1	15-09-82	15-09-82	MID-QUIN.REL.		
T O T A L S F O R S T N D										46465	184	61673	109402	
G R A N D T O T A L S										719509	12245	7114988	7847822	

Assessment:

- chinook - 33 CRT groups to determine the effect of time and size at release on survival, age at maturity, etc. (V. Bilton)
- 2 CRT groups representing production releases of similar size smolts at different dates to evaluate effect on survival (considered good opportunity to obtain production-scale data to compare with Bilton's pilot-scale study data)
- CRT 02-53-04 is most representative of "production"
- chum - no assessment
- coho - studies in progress during rearing (eg. time and size at release) disrupted due to high incidence of cataract
- 3 CRT groups represent the bulk of production (1980 brood) - fish in these groups were selected randomly and had at least one good eye
- 1 CRT group (02-22-30) represents fish with cataracts in both eyes selected from all ponds
- hatchery contribution will be estimated applying survival rates for "normal" and "blind" marked fish to the estimated numbers of normal and blind fish in the population at the time of release
- CRT groups 02-22-27, 28, 29 are most representative of "production" (1980 brood)
- fed fry planted upstream in 1982 were not marked - contribution will be estimated based on survival data for earlier broods
- pink - mark release designed to compare survival of unfed fry (ADLV) versus fed fry (all other clips); effect of release date on survival (LV versus LV and ADVL); and to provide some data on ventral fin-clip regeneration (LV and ADVL)
- in addition Quinnum pink were transplanted as fry to Bear River (Moor de Comos River) in an attempt to establish an odd-year run to the Bear
- assessment will be based on escapement of unmarked adults

Production Strategies:

Species	Stock	Brood Year	Stage at Release		
			Target	No. Juveniles Released	
Chinook	Quinnam	1981	Smolt	1,000,000	765,464
Chum	Quinnam	1981	Fed Fry	-	71,565
Coho	Quinnam	1980	Smolt	1,000,000	1,275,831
		1981	Fed Fry	400,000	263,000
Pink	Quinnam	1981	Fry	2,000,000	3,293,342
		1981	Fed Fry	500,000	249,406
		1981	Fed Fry	1,600,000	1,819,812

Chinook: Production was less than target due to low egg availability.

Chum: Pilot production to evaluate fish culture methods for chum. No plans for major enhancement.

Coho: Smolt production slightly in excess of target but compensated by high cataract incidence. Fed fry plants to the upper watershed were reduced from the original target reflecting estimated rearing capacity. Fry were released to a number of local streams through the Public Involvement Program.

Pink: Quinnum fry releases were in excess of original plan. This was possible due to expanded incubation facilities. Sockeye releases were half of target due to shortage of pens. Transplant of Quinnum fry to the Bear River was done in an attempt to establish an odd-year run. Fry were held in the Bear River for two to four days before release.

Table 4 (cont'd)

PAGE 1

ROBERTSON CREEK

SPECIES	STOCK	RELEASE SITE	BLOOD YEAR	MARK	MARKED	NO. RELEASED		TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS	
						INCOMPL.	UNMARK			START DD-MM-YY	END DD-MM-YY		
CHIN	ROBERTSON, CR	ROBERTSON, CR	81	AD	022202	23396	118	1389223	1412737	3.8	09-06-82	11-06-82	.....
CHIN	MANHATT	KANTON CR	81	AD	022233	15555	318	802	16675	5.8	05-06-82	05-06-82	.....
CHIN	ROBERTSON, CR	ROBERTSON, CR	81	AD	022354	16374	342	795	17511	4.5	08-06-82	08-06-82	10N CONN OIL
CHIN	ROBERTSON, CR	ROBERTSON, CR	81	AD	022355	15953	383	875	17211	4.5	08-06-82	08-06-82	10N HERKING OIL
CHIN	ROBERTSON, CR	ROBERTSON, CR	81	AD	022356	18549	249	815	19613	4.6	08-06-82	08-06-82	5,5A COMMENSING
CHIN	ROBERTSON, CR	ROBERTSON, CR	81	AD	022405	51797	896	6322549	6375242	5.1	31-05-82	11-06-82	.....
T O T A L S FOR CHIN													
					141624	2306	7715059	7858989					
CONO	ROBERTSON, CR	ROBERTSON, CR	80	AD	022240	48299	2196	52502	102997	24.2	13-05-82	14-05-82	LATE RELEASE
CONO	ROBERTSON, CR	ROBERTSON, CR	80	AD	022241	48606	2456	705545	756607	22.6	10-04-82	16-04-82	EARLY RELEASE
CONO	ROBERTSON, CR	ROBERTSON, CR	80	AD	022242	47837	3590	80231	131658	24.8	27-04-82	04-05-82	MID RELEASE
T O T A L S FOR CONO													
					144742	8242	838278	991262					
STND	ROBERTSON, CR	SOMASS R	81	AD	121702	27227	2368	0	29595	54.7	04-05-82	04-05-82	EARLY WILD
STND	ROBERTSON, CR	SOMASS R	81	AD	121806	9809	99	2268	12176	66.8	04-05-82	05-05-82	RB. LATE WILD
STND	ROBERTSON, CR	ROBERTSON, CR	81	AD	121810	37342	1556	7793	46691	56.8	26-04-82	13-05-82	RB. LATE HYCN.
STND	ROBERTSON, CR	ROBERTSON, CR	81	AD	121946	24601	249	21883	46733	56.0	26-04-82	13-05-82	RB. EARLY HYCN.
STND	SOMASS	SOMASS R	81	AD	121947	23482	479	0	23961	52.2	05-05-82	05-05-82	SOMASS WILD
STND	ROBERTSON, CR	ELKIE L	82	MONES4	0	0	0	170224	170224	2.0	14-07-82	14-07-82	COLONIE.
STND	ROBERTSON, CR	ROBERTSON, CR	81	MONESON1	0	0	0	62653	62653	45.9	28-04-82	13-05-82	GRADE-OUTS
T O T A L S FOR STND													
					122461	4751	264821	392033					
G R A N D T O T A L S													
					406827	15299	8816158	9242284					

Table 4 (cont'd.)

ROBERTSON CREEK**Assessment:****Mahant chinook**

- single CRT group to identify stock in fishery
- adults were captured in Mahant, eggs were incubated and reared at Robertson, molts were returned to the Mahant

Robertson chinook

- planned to mark 75,000 representing production on earth channel and 50,000 representing production in concrete raceways
- CRT 02-24-05 was applied as planned, but tagging of earth channel production (CRT 02-22-02) was discontinued because fish were molting and stressed due to handling
- for this reason unmarked groups were reassigned representation to CRT 02-24-05 regardless of pond type since this group of marked fish was most similar to the unmarked groups at the time of release
- in terms of fish size
- 3 CRT groups to evaluate the influence of body-lipid composition on ocean survival (D. Biggs)
- CRT 02-24-05 is most representative of "production"

Robertson coho

- planned to release 3 CRT groups to evaluate heritability of adult migration timing
- plan was disrupted due to fish leaks between rearing groups
- revised release strategy to determine effect of release date on contribution to catch and escapement
- "production" is best represented by combining returns for the 3 CRT groups

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles	
			Release		Target	Released
Chinook	Robertson	1981	Smolt		9,000,000	7,842,314
	Mahant	1981	Smolt		70,000	16,675
Coho	Robertson	1980	Smolt		1,000,000	991,262

General: Facilities were expended for coho (increase from 500,000 to 2,000,000 smolts) and for steelhead in 1980, but the QAC opposed coho production increases (after construction was in progress) on the basis that there would be pressure to have a terminal coho fishery during September. This could cause mixed stock fishery problems for Great chinook and steelhead stocks. A compromise solution was to increase coho production to 1,000,000 instead of 2,000,000 smolts and to increase production of chinook from 6,000,000 to 9,000,000 smolts. Rearing facilities were adequate for this species shift but there has been an ongoing problem incubating the increased number of chinook eggs. Further it was agreed to determine if coho adult migration timing was heritable. If so, it may be possible to primarily enhance the early run coho so they could be fished at the same time as Robertson Creek chinook. Depending on the outcome of these studies, coho might then be increased to the original design target of 2,000,000 smolts.

Chinook: Production of Robertson Creek chinook was slightly below expectation. Mahant chinook enhancement was initiated to rebuild this stock which is perceived as genetically unique by management biologists. Long-term plans call for a higher exploitation rate on the Robertson chinook stock by moving fishing boundaries to the west. Such a boundary shift would threaten the Mahant stock. Production was limited by brood stock availability.

Coho: Production numbers were as planned. Eggs were taken from different segments of the adult migration to evaluate heritability of timing but the study was disrupted during the rearing process (fish leakage between parallel rearing channels). For this reason the heritability study was discontinued and the ponds were released on different dates to evaluate the effect of time of release on survival.

Table 4 (cont'd)

SHOOT I												PAGE 1
SPECIES	STOCK	RELEASE SITE	MOOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE		COMMENTS
										START DD-MM-YY	END DD-MM-YY	
CHIN	MYNABO	MYNABO	81	AD 022154	34703	963	0	35446	1.6	27-05-82	06-06-82	10 DAYS HOLDING
CHIN	MYNABO	MYNABO	81	AD 022155	32041	889	6000	38930	1.0	31-05-82	06-06-82	NO HOLDING
CHIN	MYNABO	MOOS/BALL	81	MOSES 3	0	0	20100	20100	2.0	12-07-82	18-07-82	COLONIZATION

TOTALS FOR CHIN					66744	1852	26100	94696				

CHUN	FISH/AIR	FISH/AIR	81	LV32	35150	350	209628	245128	0.7	25-03-82	29-03-82	
CHUN	SALLOOM	SALLOOM	81	RV33	99100	1000	484105	584205	0.7	30-03-82	31-03-82	
CHUN	FISH/AIR	FISH/AIR	81	ADLV31	34250	700	206381	241331	0.7	25-03-82	29-03-82	
CHUN	WICLET	THORSEN	81	ADRV30	50050	1550	390045	441645	0.7	22-03-82	24-03-82	
CHUN	SHOOT/MULX	SHOOT/MULX	81	HOME49	0	0	620667	620667	0.8	24-03-82	07-04-82	

TOTALS FOR CHUN					218550	3600	1910826	2132976				

COMO	L BEL COOLA	L BEL COOLA	81	AD 022136	19703	236	36661	56600	1.4	15-07-82	17-07-82	

TOTALS FOR COMO					19703	236	36661	56600				

STYD	SHOOT/MULX	SALLOOM	82	HOME47	0	0	49100	49100	0.4	16-08-82	16-08-82	FED PRY
STYD	SHOOT/MULX	HOME48	82	HOME48	0	0	24000	24000	0.2	16-08-82	16-08-82	FED PRY

TOTALS FOR STYD					0	0	73100	73100				

GRAND TOTALS												
					304997	5688	2046687	2357372				

Assessment:
chum

- 3 stocks were marked (Fish-Air, Salloum, Mcleetaconny) for evaluation of hatchery contribution
- Salloum was previously selected as the index stock for satellited production in the Bella Coola system
- Fish-Air stock marking was split 50% ADLV and 50% LV to provide data on regeneration of clipped ventral fins
- contribution of unmarked stocks will be estimated directly from contribution of marked stocks within limits set by total catch and escapement
- Mcleetaconny chum were released in the lower Bella Coola due to budgetary constraints
- single OY group to evaluate survival of fed fry release
- coho
- chinook - 2 OY groups released into Atsarko River to evaluate the effect of instream holding on homing behaviour and survival
- plans to tag lower Bella Coola colonization group were cancelled due to poor fish health

Production Strategies:

Species	Stock	Brood Year	Stage at Release		No. Juveniles Released	
			Target	Released	Target	Released
Chinook	Atsarko	1981	Fed Fry		72,000	94,696
Chum	Bella Coola	1981	Fed Fry		1,440,000	0
	Salloum	1981	Fed Fry		432,000	584,205
	Snookli/Muhalk	1981	Fed Fry		360,000	620,667
	Moosgulch	1981	Fed Fry		72,000	0
	Klonnick	1981	Fed Fry		72,000	0
	Fish	1981	Fed Fry		72,000	486,459
	Mcleetaconny	1981	Fed Fry		360,000	441,645
	Total				2,736,000	2,132,976
Coho	Bella Coola	1981	Fed Fry		72,000	56,600

Chinook: GMD approval to start enhancing Atsarko chinook was based on decreasing run size and on our agreement to tag released fish. Further it was agreed a portion could be released into the Salloum River on the lower Bella Coola system.

Chum: Unlike some other river systems, every minor stock on the Bella Coola is viewed as discrete and enhancement is done on a stock by stock basis. This presents some difficulties in that fish captured in the mainstem (mainstem Bella Coola "stock") or captured at or near mainstem - tributary confluences may be encroaching on tributaries. Therefore, in some cases, captured fish that are assumed to be a particular stock may actually be passing through to other spawning grounds. Regardless, our intended strategy is to maintain stock separation as much as practical until the question of stock discreteness is resolved through straying studies and related genetic studies.

No eggs were taken from the "mainstem stock" because of the above cited complications and logistical considerations.

There was insufficient escapement into the Moosgulch and Klonnick to proceed with egg-takes. Our contingency plan was to take Muhalk/Thorsen and fish chum eggs if Moosgulch and Klonnick did not produce - this was done. Mcleetaconny fry were to be released at 4 Mile in the lower Bella Coola but were accidentally released into Thorsen Creek.

Coho: Enhancement of lower Bella Coola stocks was initiated due to decreasing escapement levels. It was agreed fish would be planted as fry and tagged.

Table 4 (cont'd)

PAGE 1

TENDERFOOT CREEK									
SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	MO. RELEASED		SIZE (GRAM)	COMMENTS
						INCOMPL.	UNMARK		
CHIN	BOYDISH	TENDERFOOT	81	AD	021946	59983	1224	10801	72008
TOTALS FOR CHIN									
						59983	1224	10801	72008
GRAND TOTALS									
						59983	1224	10801	72008

TENDERFOOT CREEK

Assessment:
chinook - single CWT group to determine survival to catch and escapement

Production Strategies:

Species	Stock	Brood Year	Stage at Release	
			Target	Released
Chinook	Squawfish	1981	167,000	72,000

Chinook: Eggs were taken to Capilano hatchery for incubation and rearing since Tenderfoot hatchery was still under construction during fall/winter 1981/82. Egg-take was limited by brood stock availability and 20,000 fish were lost during transport from Capilano to Tenderfoot.

Table 5. Total 1982 chinook releases by production area, stock and stage at release.

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry</u>	<u>Subyearling Smolts</u>	<u>Yearling Smolts</u>	<u>Total</u>
Upper Fraser	Birkenhead Loon	Birkenhead					
		Bonaparte		52,500	35,959	9,754	45,713
	Penny	Nicola		38,300			52,500
		Bowron		84,435			38,300
	Quesnel	Slim		67,058			84,435
		Quesnel			62,612		67,058
		Sub-total		242,293	98,571	9,754	350,618
Lower Fraser	Capilano Chilliwack	Capilano			992,996	33,752	1,026,748
		Chilliwack			4,975		4,975
	Inch	Dolly Varden					
		Harrison			356,388		356,388
		Pitt			109,665		109,665
		Post					
		Salwein					
	Jones Cr. Tenderfoot	Siddle					
		Inch					
		Nicosen					
		Squakum					
		Morrish					
		Blaney					
		Jones			72,008		72,008
		Cheakamus					
		Sub-total			1,536,032	33,752	1,569,784

Table 5 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry</u>	<u>Subyearling Smolts</u>	<u>Yearling Smolts</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum			3,466,788		3,466,788
	Chemainus	Englishman					
	Little Qualicum	Chemainus			13,723		13,723
		Big Qualicum			1,411,157		1,411,157
	Puntledge	Little Qualicum			306,889		306,889
	Quinsam	Puntledge Tsolum Quinsam Salmon			765,464		765,464
		Sub-total			5,964,021		5,964,021
West Coast Vanc. Is.	Conuma	Canton			152,000		152,000
		Conuma					
		Sucwoa					
		Triupana					
	Mitinat	Deserted			491,624		491,624
	Robertson Cr.	Mitinat Nahmint Robertson Somass			16,675 7,842,314		16,675 7,842,314
		Sub-total			8,502,613		8,502,613

Table 5 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry</u>	<u>Subyearling Smolts</u>	<u>Yearling Smolts</u>	<u>Total</u>
Central Coast	Snootli	Atnarko		94,696			94,696
		Fish/Air					
		Lower Bella					
		Coola					
		Necleetsconnay					
		Salloomt					
		Snootli					
		Sub-total		94,696			94,696
North Coast	Kalum	Cedar/Clear		56,800			56,800
		Kalum		100,650			100,650
		Chist					
		Hirsch			20,620		20,620
		Kitimat			138,850		138,850
	Mathers	Mathers					
		Pallant					
		Sub-total		157,450	159,470		316,920
Upper Skeena	Fulton	Fulton					
		Pinkut					
		Sub-total					
		TOTAL		494,439	16,260,707	43,506	16,798,652

Table 6. Total 1982 coho releases by production area, stock and stage at release.

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Total</u>
Upper Fraser	Birkenhead	Birkenhead						
	Loon	Bonaparte						
	Penny	Nicola						
	Quesnel	Bowron Slim Quesnel						
		Sub-total						
Lower Fraser	Capilano	Capilano	90,000	263,090	539,420		545,538	1,438,048
	Chilliwack	Chilliwack						
		Dolly Varden					45,380	45,380
		Harrison						
		Pitt						
		Post					37,306	37,306
		Salwein					62,888	62,888
	Inch	Siddle			39,483			39,483
		Inch			10,095			10,095
		Nicomen			41,113			41,113
		Squakum			1,000			1,000
		Norrish			4,695			4,695
		Blaney						
	Jones Cr.	Jones						
	Tenderfoot	Cheakamus						
		Sub-total	90,000	263,090	635,806		691,112	1,680,008

Table 6 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum		496,950		10,000	1,182,746	1,689,696
	Chemainus	Englishman						
	Little Qualicum	Chemainus			26,296			26,296
	Puntledge	Big Qualicum						
		Little Qualicum						
		Puntledge			2,760,697		1,001,261	3,761,958
	Quinsam	Teolun				263,000	1,275,831	1,538,831
		Quinsam						
		Salmon						
		Sub-total		496,950	2,786,993	273,000	3,459,838	7,016,781
West Coast Vanc. Is.	Conuma	Canton						
		Conuma		51,381		49,000		100,381
		Sucwoa						
		Flupana						
		Deserted						
	Nitinat	Nitinat						
	Robertson Cr.	Nahmint						
		Robertson					991,262	991,262
		Sorass						
		Sub-total		51,381		49,000	991,262	1,091,643

Table 6 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Total</u>
Central Coast	Snootli	Atnarko						
		Fish/Air						
		Lower Bella		56,600				56,600
		Coola						
		Meeteetseconnay						
		Sallcoast						
		Snootli						
		Sub-total		56,600				56,600
North Coast	Kalum	Cedar/Clear						
		Kalum						
	Kitimat	Chist						
		Hirach						
	Mathers	Kitimat		54,000				54,000
		Pallant			192,857			192,857
		Sub-total		54,000	192,857			246,857
Upper Skeena	Fulton	Pinkut						
		Pinkut						
		Sub-total						
		TOTAL	90,000	922,021	3,615,656	322,000	5,142,212	10,091,889

Table 7 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry (freshwater)</u>	<u>Fed fry (saltwater)</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum	43,285,918	2,155,553		45,441,471
	Chemainus	Englishman				
	Little Qualicum	Chemainus				
	Puntledge	Big Qualicum	1,446,877	2,747,809		4,194,686
		Little Qualicum		2,369,078		2,369,078
	Quinsam	Puntledge		71,565		71,565
		Teolun				
		Quinsam				
		Salmon				
		Sub-total	44,732,795	7,344,005		52,076,800
West Coast Vanc. Is.	Conuma	Canton		417,600		417,600
		Conuma		4,081,000		4,081,000
		Sucwoa		4,067,500		4,067,500
		Triupana		375,500		375,500
		Deserted		3,782,200		3,782,200
	Nitinat	Nitinat		27,178,532		27,178,532
	Robertson Cr.	Mahmint				
		Robertson				
		Somasa				
		Sub-total		39,902,332		39,902,332

Table 7 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Ped fry (freshwater)</u>	<u>Ped fry (saltwater)</u>	<u>Total</u>
Central Coast	Snootli	Atnarko		486,459		486,459
		Fish/Air				
		Lower Bella				
		Coola		441,645		441,645
		Necleetsconnay		584,205		584,205
		Salloomt		620,667		620,667
		Snootli				
		Sub-total		2,132,976		2,132,976
North Coast	Kalum	Cedar/Clear				
		Kalum				
		Chist		30,345		30,345
		Hirach		518,552		518,552
		Kitimat			7,207,389	7,207,389
		Mathers				
		Pallant				
		Sub-total		548,897	7,207,389	7,756,286
Upper Skeena	Fulton					
		Pinkut				
		Sub-total				
		TOTAL	44,584,195	56,965,698	7,207,389	109,157,282

Table 9. Total 1982 pink releases by production area, stock and stage at release.

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry (freshwater)</u>	<u>Fed fry (saltwater)</u>	<u>Total</u>
Upper Fraser	Birkenhead	Birkenhead				
	Loon	Bonaparte				
		Nicola				
	Penny	Bowron				
	Quesnel	Slim Quesnel				
		Sub-total				
Lower Fraser	Capilano	Capilano				
	Chilliwack	Chilliwack				
		Dolly Varden				
		Harrison				
		Pitt				
		Post				
		Salween				
	Inch	Bell				
		Inch				
		Nicomen				
		Squam				
		Sulcide				
		Blaney				
	Jones Cr.	Jones	1,572,400			1,572,400
	Tenderfoot	Cheakamus				
		Sub-total	1,572,400			1,572,400

Table 8 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry (freshwater)</u>	<u>Fed fry (saltwater)</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum				
		Englishman				
	Chemainus	Chemainus				
	Little Qualicum	Big Qualicum				
		Little Qualicum				
	Puntledge	Puntledge	819,718	50,404	50,176	920,298
		Tsolum	598,890		142,454	741,344
	Quinsam	Quinsam	5,113,154		249,406	5,362,560
		Salmon				
		Sub-total	6,531,762	50,404	442,036	7,024,202
West Coast Vanc. Is.		Canton				
		Conuma				
		Sucwoa				
		Tlupana				
		Deserted				
		Nitinat				
		Nahmint				
		Robertson				
		Somass				
		Sub-total				

Table 8 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry (freshwater)</u>	<u>Fed fry (saltwater)</u>	<u>Total</u>
Central Coast	Snootli	Atnarko				
		Fish/Air				
		Lower Bella				
		Coola				
		Wecleetsconnay				
		Salloomt				
		Snootli				
		Sub-total				
North Coast	Kalam	Cedar/Clear				
		Kalam				
		Chist				
		Hirsch				
		Kitimat				
		Mathers				
		Pallant				
		Sub-total				
Upper Skeena	Fulton Pinkut	Fulton				
		Pinkut				
		Sub-total				
		TOTAL	8,104,162	50,404	442,036	8,596,602

Table 9. Total 1982 sockeye releases by production area, stock and stage at release.

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Total</u>
Upper Fraser	Birkenhead	Birkenhead		
	Loon	Bonaparte		
		Nicola		
	Penny	Bowron		
		Slim		
	Quesnel	Quesnel		
		Sub-total		
Lower Fraser	Capilano	Capilano		
	Chilliwack	Chilliwack		
		Dolly Varden		
		Harrison		
		Pitt		
		Post		
		Salween		
		Bell		
	Inch	Inch		
		Nicomien		
		Squakum		
		Suicide		
		Blaney		
	Jones Cr.	Jones		
	Tenderfoot	Cheakamus		
		Sub-total		

Table 9 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum		
	Chemainus	Englishman		
	Little Qualicum	Chemainus		
	Puntledge	Big Qualicum		
		Little Qualicum		
		Puntledge		
	Quinsam	Taolum		
		Quinsam		
		Salmon		
		Sub-total		
West Coast Vanc. Is.	Conuma	Canton		
		Conuma		
		Sucwoa		
		Tlupana		
		Deserted		
	Nitinat	Nitinat		
	Robertson Cr.	Nahmint		
		Robertson		
		Somass		
		Sub-total		

Table 9 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Total</u>
Central Coast	Snootli	Atnarko		
		Fish/Air		
		Lower Bella		
		Coola		
		Necleetsconnay		
		Salloomt		
		Snootli		
		Sub-total		
North Coast	Kalum	Cedar/Clear		
		Kalum		
		Chist		
		Hirsch		
		Kitimat		
		Mathers		
		Pallant		
		Sub-total		
Upper Skeena	Fulton	Fulton	138,300,000	138,300,000
		Pinkut	99,700,000	99,700,000
	Sub-total	Sub-total	238,000,000	238,000,000
		TOTAL	238,000,000	238,000,000

Table 10. Total 1982 steelhead and cutthroat releases by production area, stock and stage at release.*

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Totals</u>
Upper Fraser	Birkenhead	Birkenhead						
	Loon	Bonaparte						
	Penny	Nicola						
	Quesnel	Bowron Slim Quesnel						
		Sub-total						
Lower Fraser	Capilano	Capilano			16,747			16,747
	Chilliwack	Chilliwack			10,655		66,389	77,044
		Dolly Varden						
		Harrison						
		Pitt						
		Post						
		Salwein						
	Inch	Bell						
		Inch						
		Nicomen						
		Squakum						
		Suicide						
		Blaney						
	Jones Cr.	Jones						
	Tenderfoot	Cheakamus						
		Sub-total			27,402		66,389	93,791

* see end of table for cutthroat releases

Table 10 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Total</u>
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum				22,684	51,576	74,260
	Chemainus	Englishman					22,673	22,673
	Little Qualicum	Chemainus					23,555	23,555
	Puntledge	Big Qualicum					65,427	85,863
		Little Qualicum		20,436			17,589	17,589
	Quinsam	Puntledge		44,613	47,200		91,813	91,813
		Tsolum						
		Quinsam						
		Salmon						
		Sub-total		65,049	47,200	22,684	180,820	315,753
West Coast Vanc. Is.	Conuma	Canton						
		Conuma						
		Sucwoa						
		Tlupana						
		Deserted						
	Nitinat	Nitinat						
	Robertson Cr.	Nahmint						
		Robertson			170,224		197,848	368,072
		Somass					23,961	23,961
		Sub-total			170,224		221,809	392,033

Table 10 (cont'd.)

<u>Production Area</u>	<u>Facility</u>	<u>Stock</u>	<u>Unfed fry</u>	<u>Fed fry < 2g.</u>	<u>Fingerlings 2-5 g.</u>	<u>Fingerlings > 5g.</u>	<u>Smolts</u>	<u>Total</u>
Central Coast	Smootli	Atnerko						
		Fish/Air						
		Lower Bella						
		Coola						
		McClatsconney						
		Selloost	73,100					73,100
		Smootli						
		Sub-total	73,100					73,100
North Coast	Kalum	Cedar/Clear						
		Kalun						
		Chist	25,600					25,600
		Hirsch						
		Kitimat						
		Mathers	5,128					5,128
		Pallant						
		Sub-total	30,728					30,728
Upper Skeena	Fulton Pinkut							
		Sub-total						
		TOTAL	68,877	234,171	22,684		469,013	894,745
+ Outthroat	Capilano Inch		1,281					1,281
							19,714	19,714
		TOTAL	1,281				19,714	20,995

Table 11. Post-release survival estimates for enhanced juvenile salmonids to catch and escapement*

<u>Species</u>	<u>Production Area</u>	<u>Stage at Release</u>	<u>Post-Release Survival (%) to Catch and Escapement</u>
Chinook	Coastal Upriver	Smolt (0+)	3.0
		Smolt (0 + migrant)	2.25
		Fed fry (1 + migrant)	0.75
		Smolt (1 + migrant)	4.0
Coho	All	Smolt	15.0
		Unfed fry	1.2
		Fed fry (spring release)	1.5
		Fed fry (fall release)	3.0
Chum	All	Unfed fry (artificial incubators)	0.8
		Unfed fry (Qualicum spawning channels)	0.63
		Fed fry (freshwater rearing)	2.0
		Fed fry (marine rearing)	2.5
Pink	All	Unfed fry	2.5
Sockeye	Skeena	Unfed fry	0.99
Steelhead	All	Smolt (winter)	4.0
		Smolt (summer)	3.0
		Fry (0.5 g)	0.64
		Fry (2.0 g)	1.0
Cutthroat	All	Smolt	10.0

* Estimated survival rates are based on SEP biostandards (Draft #5 - September 20, 1982) or site specific information.

Several rearing/release strategies different from those listed above are being tested. We anticipate increased survival but standard values are used to project returns for the purpose of this report. These comments apply to release of yearling chinook smolts from coastal hatcheries and rearing of pink salmon fry in salt water prior to release.

Projected returns from coho outplants to the upper Puntledge and upper Capilano rivers are downgraded to 30 percent normal survival for Puntledge and to 50 percent normal survival for Capilano reflecting turbine and spillway mortality respectively.

Table 12. Projected catch plus escapement and mark rate for all species released in 1982.

Production Area	Species	Projected Catch Plus Escapement	Number Released			% Marked
			Marked	Unmarked*	Total	
Upper Fraser	chinook	4,425	292,396	58,222	350,618	83.4
	coho	0				
	chum	0				
	pink	0				
	sockeye	0				
	steelhead	0				
	cutthroat	0				
Lower Fraser	chinook	46,892	391,898	1,177,886	1,569,784	25.0
	coho	112,094	554,487	1,125,521	1,680,008	33.0
	chum	143,264	279,215	7,009,673	7,288,888	3.8
	pink	39,310	0	1,572,400	1,572,400	0.0
	sockeye	0				
	steelhead	2,930	50,635	43,156	93,791	54.0
	cutthroat	1,881	19,714	1,281	20,995	93.9
Georgia/Johnstone Straits	chinook	177,968	733,461	5,230,560	5,964,021	12.3
	coho	547,437	291,887	6,724,894	7,016,781	4.1
	chum	433,246	760,488	51,316,312	52,076,800	1.5
	pink	175,603	344,284	6,679,918	7,024,202	4.9
	sockeye	0				
	steelhead	7,857	168,463	146,210	315,753	53.3
	cutthroat	0				

* includes unmarked fish and incomplete marks

Table 12 (cont'd.)

Production Area	Species	Projected Catch Plus Escapement	Marked	Number Released		% Marked
				Unmarked*	Total	
West Coast Van. Is.	chinook	255,077	292,543	8,210,070	8,502,613	3.4
	coho	150,931	195,610	896,033	1,091,643	17.9
	chum	798,048	608,204	39,294,128	39,902,332	1.5
	pink	0				
	sockeye	0				
	steelhead cutthroat	10,574 0	122,461	269,572	392,033	31.2
Central Coast	chinook	947	66,744	27,952	94,696	70.5
	coho	849	19,703	36,897	56,600	34.8
	chum	42,660	218,550	1,914,426	2,132,976	10.2
	pink	0				
	sockeye	0				
	steelhead cutthroat	468 0	0	73,100	73,100	0.0
North Coast	chinook	5,966	159,462	157,458	316,920	50.3
	coho	3,703	31,282	215,575	246,857	12.7
	chum	191,163	142,112	7,614,174	7,756,286	1.8
	pink	0				
	sockeye	0				
	steelhead cutthroat	307 0	4,171	26,557	30,728	13.6

81

* includes unmarked fish and incomplete marks

Table 12 (cont'd.)

Production Area	Species	Projected Catch Plus Escapement	Marked	Number Released Unmarked*	Total	% Marked
Upper Skeena	chinook	0				
	coho	0				
	chum	0				
	pink	0				
	sockeye	0				
	steelhead	2,356,200	0	238,000,000	238,000,000	0.0
	cutthroat	0				

* includes unmarked fish and incomplete marks

Table 13A. Anticipated returns to selected fisheries and mark rates for chum salmon released in 1982.

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total Returns (Marked & Unmarked)* in		
				1984	1985	1986
Queen Charlotte Is. (East)	Pallant	Ad-022144	7.7	3,441	5,899	492
		Ad-022146	6.2	3,479	5,965	497
		Ad-022148	94.9	56	97	8
		None	0.0	56,088	96,152	8,013
	Mathers	LV	9.3	3,077	5,275	440
		RV	51.1	553	947	79
	Kitimat	None	0.0	212	364	30
		None	0.0	4,345	7,448	621
Bella Coola GN	Snootli/Nuhalk Necleetsconnay Salloomt Fish/Air Fish/Air	AdRV	11.3	3,092	5,300	442
		RV	17.0	4,089	7,010	584
		LV	14.3	1,716	2,942	245
		AdLV	14.2	1,689	2,896	241
	Big Qualicum	RV	3.9	15,089	25,867	2,156
		AdRV	.57	96,051	164,660	13,722
Johnstone Str.	Little Qualicum	LV	3.3	19,235	32,974	2,748
		AdLV	15.9	4,051	6,945	579
	Puntledge	Ad-022252	5.4	4,809	8,244	687
		Ad-022253	4.8	5,145	8,820	735
		Ad-022254	4.0	6,309	10,816	901
		None	0.0	320	548	46
	Quinam	None	0.0	626	1,073	85

Table 13A (cont'd.)

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total Returns (Marked & Unmarked) in		
				1984	1985	1986
West Coast Vancouver Is.	Sucwoa	LV	3.2	7,175	12,300	1,025
	Sucwoa	RV	6.2	3,723	6,323	532
	Canton	Ad-022206	23.4	2,923	5,011	418
	Sucwoa	Ad-022255	5.7	3,595	6,163	514
	Sucwoa	Ad-022256	1.4	13,979	23,964	1,997
	Tlupana	AdRV	25.9	2,629	4,506	376
	Deserted	None	0.0	26,475	45,386	3,782
	Conuma	None	0.0	28,567	48,972	4,081
	Nitinat	LV	1.1	47,744	81,847	6,821
		RV	1.1	46,950	80,486	6,707
Fraser GN **		AdLV	3.2	16,134	27,658	2,305
		AdRV	1.0	47,879	82,079	6,840
		None	0.0	31,543	54,073	4,506
	Chilliwack	LV	5.4	6,439	11,039	920
		RV	5.1	14,732	25,255	2,105
		AdLV	5.4	6,365	10,912	909
	Inch	None	0.0	8,989	15,410	1,284
		Ad-022160	3.9	6,117	10,486	874
		Ad-022224	4.2	6,619	11,347	946
	Jones	None	0.0	880	1,508	126

* Groups with mark type "none" are not directly represented by a mark.

** Assumes no exploitation in Johnstone/Georgia Straits.

Table 13P. Anticipated returns to selected fisheries and mark rates for pink salmon released in 1982.

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total	
				(Marked & Unmarked)	Return
Johnstone Strait	Jones	None	0.0	39,310	
		None	0.0	23,007	
	Puntledge	AdRV	1.8	82,334	
		ADLV	100.0	753	
		LV	32.5	2,307	
		RV	47.6	3,175	
		None	0.0	45,495	
	Tsolum	LV	95.6	1,408	
		RV	77.8	740	
		ADLV	9.9	14,972	
		AdRV	90.5	740	
		None	0.0	672	

Appendix 1. Addresses and telephone numbers of SEP facilities.

SOUTH COAST UNIT

F/Head, B.C. Pearce
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-3909

Big Qualicum Project

R.R. #3
Qualicum Beach, B.C.
V0B 2T0

Grant Ladouceur - SEO
604-757-8412

Chemsinus River Hatchery

Mgmt - Seespring Salmon Farm
P.O. Box 870
Chemsinus, B.C.
V0R 1K0

Doug Harpham - Contractor
604-246-9191

Conna River Hatchery

Box 247
Tahsis, B.C.
V0P 1X0

Iain MacLean - SEO
Van. radio 0711
N710-215 on chan. 7
sched. time: 0915-0930

Little Qualicum Channel

c/o B.C. Pearce
604-666-3090

Nitinat Hatchery

P.O. Box 0
Franklin River, B.C.
V0R 3L0

Colin Harrison - SEO
Campbell River radio
N692766 Bamfield chan.
sched. time: 1200-1230

Pentledge Hatchery

Box 3111
Courtenay, B.C.
V9N 5N3

Harry Gano - SEO
604-338-7444

Quilness Hatchery

Box 467
Campbell River, B.C.
V9M 5C1

Jim VanTine - SEO
604-287-3554

Robertson Creek Hatchery

Box 1118
Port Alberni, B.C.
V9Y 7L3

Don Lusseth - SEO
604-334-6521

NORTH COAST UNIT

A/Head, C.J. West
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-2948

Fulton River Channel

Box 9
Granisle, B.C.
V0J 1W0

Stu Barnettson - SEO
604-697-2314 or
604-697-2424

Kelum Pilot

(c/o Kiltimat Hatchery)

Kiltimat Hatchery

Box 197
Kiltimat, B.C.
V8C 2G7

Dave McNeil - SEO

604-632-5188 warehouse
604-639-9888 hatchery

Mathers Creek

c/o Pallant Creek

Pallant Creek Hatchery

Box 225
Sandspit, B.C.
V0T 1C0

Pet Slobodzian - SEO
Pr. George Radio Op.
N690080 on the Trutch chan.
or 604-666-3575

Pinkut Channel

c/o Fulton River

Scootill Hatchery

Box 95
Bella Coola, B.C.
V0T 1C0

Russ Hilland - SEO
604-982-2522

FRASER R., NBC & YUKON UNIT
Head, C.N. MacKinnon
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-0197

Birkenhead Hatchery

P.O. Box 343
Pemberton, B.C.
V0N 1L0

Bill Foye - SEO
Dave Celli - ASE0
604-894-6044 or call Inch Cr

Capilano Hatchery

4500 Capilano Park Rd.
North Vancouver, B.C.
V7R 4L3

Eldon Stone - SEO
604-987-1411

Chilliwack Hatchery

Chilliwack Lake Road
R.R. #5
Chilliwack, B.C.
V0X 1Y0

Don Buxton - SEO
604-858-7227

Inch Creek Hatchery

P.O. Box 81
38620 Bell Road
Dewdney, B.C.
V0M 1L0

Bill Foye - SEO
604-826-0244

Loon Creek Hatchery

c/o Gordon Berezay
604-666-8646

Quesnel Hatchery

P.O. Box 4711
Williams Lake, B.C.
V2G 2V7

Robin Dickson - SEO
604-790-2266

Stuart River Hatchery

c/o Don MacKinnlay
604-666-3520

Tenderfoot Creek Hatchery

Box 477
Breckendale, B.C.
V0N 1H0

Bill Foye - SEO
Dave Celli - ASE0
604-898-3320 or call Inch Cr